Applying service design thinking to improve hospital innovation

- A case study of hospital innovation in Capital Region, Denmark.

Rigshospitalet

Nordsjællands Hospital

Bornholms Hospital

Herlev / Gentofte Hospital

Amager / Hvidovre Hospital

Bisbebjerg / Frederiksberg Hospital

SERVICE SYSTEMS DESIGN
AALBORG UNIVERSITY COPENHAGEN
MASTER THESIS

ABSTRACT

This thesis explores the practice of service design and applies it to a real case scenario when developing a service to improve the conditions for hospital innovation in Denmark. It explores how service design and open innovation has brought along new opportunities for innovating practice within hospitals. It includes an investigation of how hospitals in the Capital Region of Denmark are currently innovating their hospital practice and how the actors involved can be better supported and equipped during this process.

Via co-creation with key stakeholders in the hospital innovation ecosystem a new service is developed from defining the problem to a service prototype. The service design process and the tools it involved are presented and reflected upon throughout the report.

The result of the service design process is Hospital Innovation Hub, a digital platform for hospital innovation actors. It enables the users to ideate and co-create hospital practices collaboratively, hereby reducing time and effort and simply achieving smarter solutions.

The later sections of the thesis reflect on the role service design can play in the hospital innovation sector. On this foundation, it provides recommendations for how service designers might learn from the experiences gathered throughout this process.

KEYWORDS
Service design, hospital innovation, co-creation, open innovation.

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LEARNING GOALS

The following outlines the official learning goals for the thesis, as well as personal learning goals. They will serve as points of reflection towards the end of the project.

LEARNING GOALS FROM THE STUDY GUIDE
Study guide states the following qualifications to be obtained:

Knowledge
• Must have knowledge about the possibilities to apply appropriate methodological approaches to specific study areas.

• Must have knowledge about design theories and methods that focus on the design of advanced and complex product-service systems.

Skills
• Must be able to work independently, to identify major problem areas (analysis) and adequately address problems and opportunities (synthesis).

• Must demonstrate the capability of analysing, designing and presenting innovative solutions.

• Must demonstrate the ability to evaluate and address (synthesis) major organisational and business issues emerging in the design of a product-service system.

Competences
• Must be able to master design and development work in situations that are complex, unpredictable and require new solutions (synthesis).

• Must be able to independently initiate and implement discipline-specific

and interdisciplinary cooperation and assume professional responsibility (synthesis).

• Must have the capability to independently take responsibility for own professional development and specialisation (synthesis).

(Aalborg University, Faculty of engineering and science, Board of studies for Media technology, 2018).

PERSONAL GOALS
In addition to goals provided by the study board, I defined personal goals for the thesis:

• Facilitate and complete innovative co-creation sessions with relevant participants.

• Specialise in an area of interest and apply a service design mindset to add value in this area.

• Use tools from the service design toolbox that are new to me and learn from the experience.

INTRODUCTION

Hospitals are not following the rapid developments we have seen in other industries. According to Henrik Schødts, project director of hospital Nordsjælland, hospitals today basically operate same way as they did 100 years ago (Mandag Morgen, 19 May 2018). With the increase of populations, lifestyle diseases and people getting older there is a huge need to rethink how our hospitals can run most efficiently. Simultaneously, healthcare innovation outside the hospitals is booming. Big data, AI, VR, immunotherapy, 3D printed devices, biosensors/trackers, point-of-care diagnostics etc. offers the hospitals a great range of improvement opportunities.

IT giants like Apple, Google, Microsoft and Amazon have discovered the digital innovation potentials and have all entered the healthcare sector transformation. When Apple released their latest Apple Watch series 4 in September, they surprised the world with a new feature of taking electrocardiograms. In other words, the watch tracks the heart's electrical activity whereby the user can detect abnormalities. *"This is the first ECG product offered over the counter, directly to consumers."* said Apple COO Jeff Williams at the launch (Wired, 13 September 2018). Earlier this year Amazon announced a plan to launch an independent company offering healthcare services to their employees at a lower cost than competitors. Within just two hours of the launch, it resulted in a 30 billion dollar decrease of market value for the biggest companies in healthcare (Quartz 30 January 2018).

If hospitals do not wake up and start participating in the healthcare development, the new service solutions will become highly commercialised and thereby not available for all patients and citizens. In Denmark we are proud to have a hospital system that offers free and equal healthcare for all citizens. The hospitals need to take a defining role in the innovation race. For this to happen traditional research patterns, traditions and routines need to be challenged and replaced by collaborative design of an optimal service experience for both patients and healthcare professionals.

This thesis takes a human-centered approach when exploring the needs of actors within hospital innovation. Who are the dominating actors and what are their procedures, context and conditions? It will explore the system they currently work in. What are their struggles? What are their needs? What systems currently exist to help them in innovating hospital practice? Initiatives of how to improve their conditions are explored and analysed with a service design approach, resulting in a service concept proposal.

The service proposed in this thesis is an open innovation platform for hospital improvements. It has been co-created with actors in the Danish hospital innovation ecosystem from idea creation to final service proposal.

The thesis consist of two reports: a process report and a product report. The process report outlines the theoretical approach, the process of designing the service as well as all the reflections made during the different stages and while using the different design tools. The product report describes what the service is as it would be presented to a potential client.

All interviews and workshops have been conducted in Danish. Thus, all quotes within this thesis are translations from Danish.

PROJECT MANAGEMENT

DOUBLE DIAMOND

To organise the project progress, the Double Diamond model was used. It was developed by the British Design Council in 2005 to illustrate the thinking pattern of a design process switching between divergence and convergence (British Design Council, 2005). When diverging, the designer opens up and gathers new findings, breaks elements into more parts and explores the complexities. When converging, the designer moves towards union, bringing elements together and forms something more concrete.

Double Diamond Model
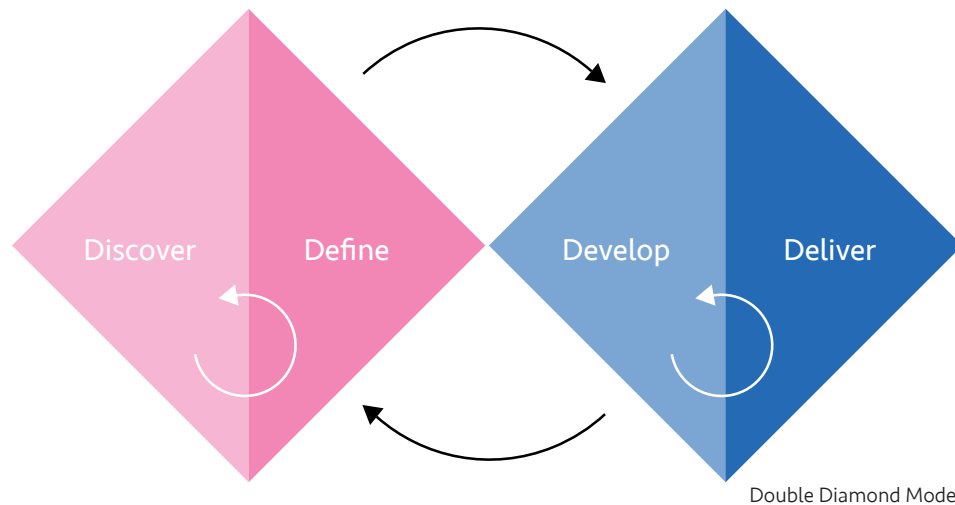
The four stages are 1) Discover where the designer aims to look at the world in a fresh way and gathers insights. 2) Define, where the designer aims to make sense of all the possibilities and frame a fundamental design problem. 3) Develop is the stage where concepts are created, prototyped, tested and iterated. This enables improvements and refinements of the service concepts. The final stage 4) Delivery is where the service is finalised and launched.

Although the model seems linear at first glance it is actually highly iterative (Stickdorn & Schneider, 2011) The design progress moves through each phase several times and might jump back and forward depending on the outcome of the phase. It is vital to make recurrent leaps between designing on a detail level and designing holistically.

LOG

From the very beginning, a session log was kept as a digital diary to document the activities and key findings of each work day. It includes which decisions were made, meeting agendas and general reflections. This resulted in a clear chronological documentation of the end-to-end design process which helped remember the order in which progress happened.

The log can be found in the appendix.

KANBAN BOARD

I used a Kanban board to ensure each part of the project was going to be built and prioritized with the same level of care at every step. A Kanban board is an agile way to organize and prioritize your flow/queue with transparency and accountability (Medium.com, 2017). It focuses on status instead of due dates. Each task moves through different stages, I chose the simple version with the stages TO DO, IN PROGRESS and DONE.

The Kanban ensured a nice overview of the tasks ahead and the post-its allowed for easy re-prioritization of the tasks. In addition, it provided a great feeling of accomplishment each time a task could be placed in the DONE stage.

PROCESS PLAN

Below is a visualisation of the process plan showing how the different phases overlapped throughout the timeline. As it shows there was a three months gap in the timeline from May - July where I was occupied for other matters.

Kanban Board

Discover		Define	Develop		Deliver	Report
January	February	March	April	August	September	
	SV1	SV2	SV3	SV4	SV5	SV6	SV7	SV8

Supervisions

SV1   SV2   SV3   SV4   SV5   SV6   SV7   SV8

Key dates

Litterature Search

Check Point

Hand In
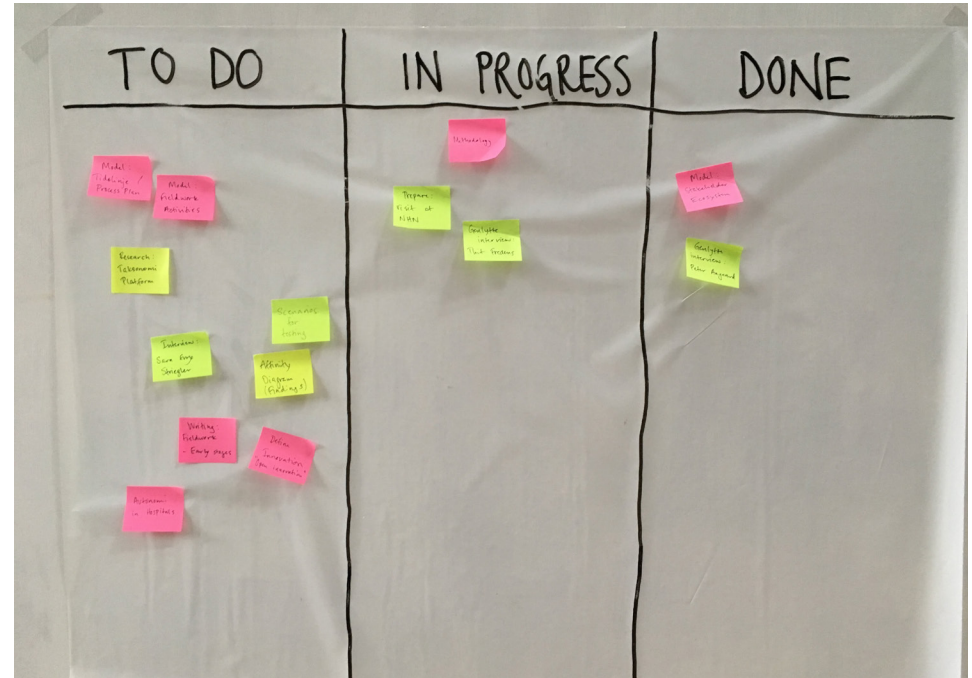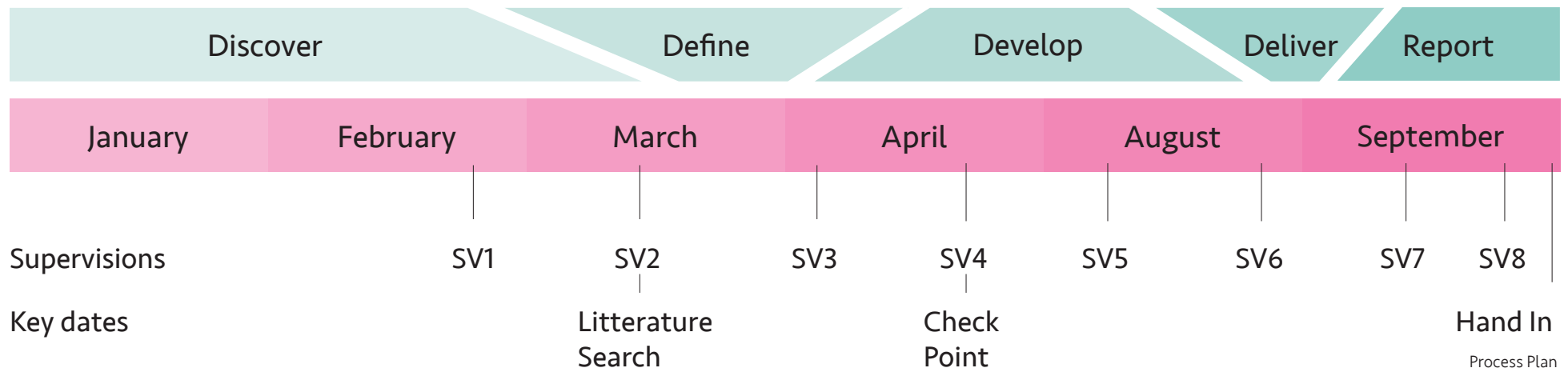
Process Plan

METHODOLOGY

SERVICE DESIGN

This thesis follows the mindset and approach of service design. The following chapter is a brief introduction to the main principles and concepts of service design. Service design came into practice in the beginning of the 90's (Moritz, 2005) and has since grown in popularity as it has been introduced industries ranging from financing to healthcare. Many definitions and variations exist as it is still an evolving practice. One of the more popular definitions are from Stefan Moritz (2005): *"Service Design helps to innovate (create new) or improve (existing) services to make them more useful, usable, desirable for clients and efficient as well as effective for organisations. It is a new holistic, multidisciplinary, integrative field"*.

Since there is no common definition of service design, it is more relevant to present a five core principles that Stickdorn & Schneider (2011) has identified:

1. **It is user-centred.** The inherent intension of a service is to meet the user needs and it is therefore crucial to empathise with them and understand their habits, culture, social context and motivations (Stickdorn & Schneider, 2011). Gaining authentic insights about users includes the application of methods and tools that allow the service designer to slip into the shoes of the user and understand their individual service experience as well as the surrounding context.

2. **It is co-creative.** Providing a good service demands consideration of the various stakeholders influencing the service. During the service design process it is important to involve the users as well as all other stakeholders when exploring and defining the service proposition. This is co-creation. As a service designer your role is to facilitate this in groups representative of the stakeholders. The co-creation evokes co-ownership which in turn will result in increased service loyalty.

3. **It is sequencing.** As a service designer you think of the service as a stage-play where series of actions are combined to a moving sequence. Service processes are deconstructed into single touch-points and interactions and carefully analysed for improvement potentials. All actions should be well orchestrated to ensure a pleasant rhythm and flow in the service.

4. **It is evidencing.** Intangible service elements should be visualised in terms of physical artefacts. The physical evidence or artefacts need to be designed according to the service's inherent narrative and the sequence of the touchpoints. The quality, the look & feel and the unique design of the different elements throughout a service journey is often what the users remember.

5. **It is holistic.** The aim for the designer is to consider as many aspects of the service as possible. Firstly, this include the level of individual touchpoints where focus should be on the environment where the service takes place. Secondly, there's the level of the service sequence where the designer should explore alternative journeys based on the mood and feelings of all stakeholders throughout the journey. Finally, there is the level of the service provider where organisational values, norms, structures and processes should be taken into account.

Service design principles

Service design draws from the designer's mindset and toolkit when using empathy and experimentation to develop innovative and desirable service solutions (IDEOU.com). It explores the possibilities of technology to ensure the optimal functionalities are integrated into the service experience. Finally it considers what is economically viable to ensure business efficiency.

The director of Danish Design Centre Christian Bason has recently highlighted service design as a suitable approach to transforming the hospital sector (Danish Design Centre, 1 September 2016). Three factors makes it suitable in his opinion as service design facilitates:

 - **Professional empathy:** insight into patient experiences of service processes in practice, from A to Z.
 - **Co-creation:** systematic involvement of healthcare professionals and their stakeholders in bringing their own professional competences into play and taking responsibility for new solutions.
 - **Implementation:** testing and monitoring that the new approaches work in practice and become part of the organisation's new reality.

Christian Bason urges the hospitals to test this approach by employing service design teams at minimum three hospitals. The teams should engage in a focused effort to transform the most critical patient processes and ensure thorough monitoring and documentation of both the process and the generated effects. It is essential to generate evidence to motivate the rest of the system to embrace the approach.

CO-DESIGN
As the main principle for the service concept proposed in this thesis is co-design it is relevant to take a closer look at the term.

Co-design has become a very popular term that refers to a process in which different designers and other relevant actors engage in jointly designing a product or a service (Jørgensen et. al 2011). The 'co' is a reference to 'collab-

orative' showing that the traditional role of the designer as the solo creator of new ideas has evolved. In the fifties designers started seeing the potential of achieving an understanding of their future users of their products. They therefore started 'User-Centred Design', where the users were seen as subjects of study and were therefore observed and analyzed. During the next decades designers gradually moved closer to the subjects, whom in the 1970's were invited to participate in the design process (ibid.). The methodology 'Participatory Design' had been born, where the designer started interviewing the users and getting them to test prototypes. The role of the users were still narrowed to inform the experienced designer who continued to have a role as the 'creator' of the design.

Co-design is a further development of Participatory Design in which the user not only informs the designer, but actually collaborates with the designer. Summing up, co-design means going the final step towards the user from observing the user (user-centred design), to engaging the user (participatory design), to collaborating with the user (co-design). Co-design has become a core aspect of the service design philosophy and involves collaboration with not only the users but also staff, designers, field, experts etc. (Stickdorn & Schneider 2011 p. 198-199).

The ambition during this thesis has been to co-design with key stakeholders in the health innovation ecosystem starting as early in the design process as possible. The value of collaborating on early stages is that it enables the stakeholders to collaboratively define the challenges to tackle and how to maneuver in their (future) surroundings. The aim is to uncover and use hidden desires and needs plus latent feelings linked to the service experiences of the individuals within the context that surrounds them. My role as the service designer is simply to facilitate and coordinate how these insights and ideas can materialise into a useful, efficient and appealing service.

MAIN AREA OF INTEREST

During the two years leading up to this thesis I have had an increasing interest in applying service design thinking to the healthcare sector. It originated when I myself was in need of healthcare for the first time in my life. I had been diagnosed with pre stages to breast cancer and went through four operations during a period of 1,5 years - luckily with a happy ending when my case was closed in the summer of 2017. During this period I was a frequent visitor at the largest hospital in Denmark Rigshospitalet. My calendar was suddenly packed with preparation appointments, follow-up appointments, status appointments and four admissions each followed by 1-7 days of recovery at the hospital. Many hours were spent in waiting rooms, examination rooms, recovery rooms and in the hallways when attempting to find the locations I was directed to.

Even though I met only highly qualified, kind and proficient healthcare providers throughout the whole period, I am still amazed how the experience recalls memories of process errors, communication failures, great resources wasted on getting lost, waiting for promised answers that I had to track down myself etc. My experience of the service system at Rigshospitalet was simply horrifying. As a soon-to-be service designer this experience left me with a mission: I want to help improve the experience of patients, healthcare providers and other users of the Danish hospitals.

Just after completing my treatment at Rigshospitalet I started a full time internship at the Danish Design Centre. One of their five focus areas is Design Health which explores how design can contribute to health effects and services that are centred around the patient. By connecting healthcare sector, business and industry, the Danish Design Centre looks into providing innovative services that meet individual needs, hand control back to the patients and utilise the patients' resources (danskdesigncenter.dk). Following the projects on Design Health from up close sparked my interest in the area even further. It opened my eyes to the many potentials design and new technology offers for the healthcare sector which made my personal experiences at Rigshospitalet stand out even more inefficient and outdated. Why are the hospitals not utilizing these potentials? This key interest made me look further into healthcare innovation.

AN INTRODUCTION TO KEY CONCEPTS

In the following chapter, selected information is presented to give the reader of this thesis a basic foundation of knowledge into the field of healthcare innovation in the context of Danish hospitals. It is sourced and selected from a large amount of desktop research studied during different phases of the project. Even though desktop research is presented here as a whole, it has been gathered throughout the whole process parallel to fieldwork findings, service development and prototyping. As the process has been iterative, new findings in the field have steered me into new research areas to uncover. The following insights have all been vital during the development of the service; some of it in the early stages, some later.

HEALTH INNOVATION

The following is a brief introduction to health innovation. It explains key concepts and definitions within the field, which will be used throughout the thesis.

Innovations are new ideas that are put into practice, creating value for users or customers (Gabriel et. al., 2017). Innovation is often described as going from radical; completely changing the way that things are done, to incremental; making small improvements to existing concepts.

Applied to health, innovation can mean many things and therefore I will use the definition of the recognised innovation foundation Nesta: *"Health innovation includes innovations in healthcare, as well as innovations to prevent illness and promote health and wellbeing. It might take the form of new products, services, processes, organisations or policies. In fact, it often involves several of these simultaneously."* (Gabriel et. al., 2017, p. 10). Successfully launching a new technological health innovation, for example, could require designing new technologies, new business models, new processes, new roles for patients and clinicians supported by policy changes.

Hertog et al. (2005) suggests to divide health innovation into three types:

1. **Technological and clinical innovation**
   New therapeutic drugs, diagnostic tests, medical devices, software, surgical techniques

2. **Process and service innovations**
   New institutions, business models, service models, clinical pathways, roles, education and training

3. **Systems Innovations**
   Policy innovation, systems reform

Nesta introduces four stages of health innovation (Gabriel et. al., 2017. p. 11)

1. **Problem identification**
   Identifying, breaking down, and carrying out research into health problems.

2. **Invention**
   Developing ideas for new services or products.

3. **Adoption**
   Putting new ideas into practice incl. prototyping, testing and evaluating safety and effectiveness

4. **Diffusion**
   Wider uptake of the idea, service or product across the organization or into many organizations.

According to Accenture's 2016 Healthcare Innovation Research, leaders of healthcare companies are increasingly likely to consider innovation to be an enabler of long-term success (Accenture: Healthcare Innovation, 2017). Their research show that 79% of providers and payers state that their organization's strategy is extremely or very dependent upon innovation. Accenture has further analysed this and argue that the innovation output of the healthcare companies is low, because it is focused on incremental product and service improvements. The organizations simply fail to produce disruptive innovation.

The healthcare industry has long relied on traditional and linear models of innovation based on applied research followed by development and commercialisation (Bhatti et. al, 2018). Nesta have identified three main problems with dominant models of health innovation (Gabriel et. al., 2017):

1. **Inefficiency:** Moving from problem finding to implementation is a very slow process in the health industry - it often take years, even decades for an innovation to be fully implemented or launched. It is linked to high cost and complex trial procedures. It is often poorly targeted as the solutions often does not address the areas that have been identified as high priority. Health innovation has also shown to be poorly adopted and diffused, even when there is good evidence that new practices, technologies or service models are effective.

2. **Gaps in understanding needs:** The people involved in health innovation are often far from the world of healthcare practice. Inventors may not truly understand the needs of patients or clinicians or maybe they do not have access to sufficient data.

3. **Dominated by professionals.** The innovation team often have expertise to innovate and set the agenda and as a result often fail to address the priorities of citizens.

DESIGN DRIVEN INNOVATION IN HEALTH

In contrast to the linear models of innovation, an emerging approach to innovation at healthcare institutions worldwide is more focused on the user experience. In Denmark as well as The Netherlands, UK, Germany, USA and Canada the healthcare sectors increasingly apply human-centered design approaches to their innovation processes, resulting in interdisciplinary collaborations where patients act as co-creaters of the service solutions.

The Mayo Clinic Center for Innovation (CFI) established in 2008 in Minnesota USA, was the first healthcare innovation center to employ a team of in-house designers (Bhatti et. al, 2018). Their motto is *"the needs of the patient come first"* and they use a human-centered design approach to transform the experience and delivery of healthcare. Their interdisciplinary teams include service designers, clinicians, project managers, information technology specialists, innovation coordinators, hospital staff members and patients.

To give another example, Mckinsey has recently advocated for a design driven approach to pharma launches (Mckinsey.com, August 2018). Traditionally pharma launches has been all about the new drug or medical device highlighting its clinical effects, its safety or its superiority to alternatives. However, Mckinsey have worked with a design driven approach when supporting more than 50 pharma launches and conclude that "Best-in-class pharma companies no longer launch products; they launch experiences." (Mckinsey.com, August 2018). Mckinsey's approach is based on customer journeys, personas, co-creation with customers, storyboards, fast prototyping etc. - all well known tools from the service design toolbox.

As it often happens this trend into more human-centered design approaches to innovation has been adopted faster in the private sector than the public. However, public sectors around the world are slowly picking up the trend as well. The National Health Service in UK (NHS) opened The Helix (Healthcare Innovation Exchange) Centre in 2014. Helix is a pop-up design studio in the courtyard of one of London's busiest hospitals, St Mary's (Bhatti et. al, 2018). This is the first time within the NHS that designers, engineers and clinicians

are brought together to co-create, identify challenges and provide healthcare solutions.

According to Freire & Sangiorgi (2010) the transition into a more human-centered approach is challenging for the healthcare industry to adopt. The implementation of the co-creation model demands healthcare facilitators to develop new skills, sensitivity and attitudes (ibid.). Generating lasting and transformative projects in the healthcare industry require efforts that question the very assumptions and norms behind service practices and interactions. It requires engaging the right set of actors at the right moment. And it requires to allocate and release power to project participants, co-creating flexible platforms or 'infrastructures' that people can own, inhabit and transform.

OPEN INNOVATION

According to Lindegaard & Kawasaki (2010) there is no agreed upon definition of open innovation as organizations apply it to different contexts. However, open innovation is essentially about bridging internal and external resources throughout the entire innovation process. All actors involved in an open innovation process focus on problems, needs and issues and work them out together. In contrast, closed innovation aims to keep discoveries highly secret while maintaining complete control over all aspects of the design process. It is often performed in closed R&D environments with the purpose of reaching that brilliant idea that will result in gaining the first-mover advantage (ibid.).

Good ideas are widely distributed today channeled by the internet and global connectedness. Open innovation brings along the end of knowledge monopolies, and it works with multiple sources of ideas and interaction, combined through networks (communities of practices), with users being part of that network. In this paradigm a designers' role becomes the one to facilitate the connections among actors by providing the right tools for co-creation (Cottam & Leadbeater, 2004).

Open source innovation

Open innovation has led to a whole new open source movement where everyone has unrestricted access to designs, products, and ideas and can apply them to a variety of sectors for diverse purposes. Open source innovation has not only revolutionized e.g. the software and biotech industries, it has completely changed the way we think about creativity. In order to do something new, you don't have to build something from scratch, you can use existing and emerging designs, made available through open access, and apply them to a new context. Open source services are thereby enabling countless possibilities for growth. This has brought along a huge increase of democracy in the innovation game. With open source innovation there is virtually no hierarchy or discrimination against persons or groups or political agendas.

Applied to a societal context scholars have introduced open paradigms, where citizens are looked at as co-creators of their own wellbeing. Cottam & Leadbeater (2004) has for example proposed a welfare state model, introducing the notion of 'open welfare'. They recognise that the majority of public sector innovations from the past *"have been designed to make the traditional, closed model of service delivery more efficient"* and argue *"that many of the biggest improvements in public services will come from mass, participatory models, in which many of the "users" of a service become its designers and producers, working in new partnerships with professionals".* This is interesting from a service designers point of view where your role often is to offer the smartest co-creation facilitation for the users and other key stakeholders in that specific context.

According to Freire & Sangiorgi (2010) designers have adopted two different approaches to innovation: working within organisations to introduce design methods and suggest new service configurations; or acting outside the system to generate radically new solutions. These two main innovation strategies can also be identified in design methodologies that have moved from an emphasis on co-design and co-production, towards the emergence of a co-creation philosophy.

So what then is the potential of applying open innovation to health? Collaboration in health innovation is nothing new as described in the previous paragraph. What makes the open innovation approach distinctive is how it blurs the traditional roles between actors. It implies a fully open partnership between patients, professionals and community working together throughout the whole design process throughout problem identification, invention, adoption and diffusion.

The potentials for applying open innovation to healthcare industry include (Gabriel et. al., 2017.):

- Evidence and data are generated openly and collaboratively.

- Ideas are initiated from multiple sources, not just researchers and product suppliers.

- Innovation is based on the needs of patients and the knowledge of practitioners.

- National and international collaboration increases as policymakers realise that health systems around the world can benefit from each other's learnings.

The role of platforms in open innovation
The word platform has various meanings to it; e.g. a raised level surface or a shoe with very thick soles (Oxford dictionary definition). In this context platform should be understood as *"An opportunity to voice one's views or initiate action. 'the forum will provide a platform for discussion of issues'"* (ibid.)

The move into increased co-design creates the need for larger knowledge-sharing platforms. Platforms are essentially what sustain and elevate innovation (Bush & Fox, 2016). Platforms enable the move from siloed solutions to much richer, more meaningful and efficient solutions. Building on shared infrastructure, fuelled by data and defined by multiple user interactions, platforms bring together people, processes, policies and networked technology to create a holistic system. In other words, they allow us to collaborate and interact on a global scale. (Jeroen Tas, 2017).

Fuelled by new IT technologies, the number and scale of digital platforms has soared globally. They bring together actors in various networks and allow high-value and frictionless exchanges (icsb.nl). Their chief assets are information, data and interactions.

Platforms have become so important and mainstream that a Platform Design Toolkit has been introduced in 2013 to overcome the limitations of the very famous and recognised Business Model Canvas (BMC) created by Alex Osterwalder. BMC is great to identify model linear aspects of businesses and services but fails in modelling emerging, multi-sided, ecosystem based, platform models where different players - all with their different motivations to join - co-participate in the whole value creation process (platformdesigntoolkit.com)

Pelle Ehn in his work on Participatory Design (2008) talks about 'infrastructing': *"an infrastructure, like railroad tracks or the Internet is not reinvented every time, but is 'sunk into' other sociomaterial structures and only accessible by membership in a specific community-of- practice".* With this perspective, the designer's role is to build these infrastructures or platforms (like maps) that show the connections (like roads and signs) between actors (like places) which enable people in that sphere to create their own route to change. He argues that behavioural change is about building the capability and the systems that allow change to occur (ibid.).

INITIAL DIRECTION

While gathering the initial research and empathising with actors within healthcare innovation (see below) I kept looking for problems to tackle. A few early ideas were discarded during this process. Initially I looked at the healthcare sector as a whole and wondered why the know how and capabilities are not shared and utilized better by increased collaboration (and ideally co-creation) across the sector. The whole concept of open innovation seemed to not be fully explored and utilized. I therefore formulated an initial problem statement to look further into this:

How can a service system provide optimal conditions for open innovation within the healthcare sector?

Keywords: Open innovation, Health innovation, co-creation, design thinking, service design

Obviously this statement is too broad for a final design brief, however it served as a good starting point when starting the design process.

PROBLEM FINDING

As a first step, I sought expert knowledge and opinions within the area of healthcare innovation. With the aim of diverging and gathering a broad understanding of the theme including potential problems to further investigate I contacted experts from different organizations with different approaches and perspectives to healthcare innovation. In a document I listed all the potential stakeholders who could provide valuable insights to my process. Every time I spoke to someone from within the industry I asked them to add relevant people to my list. It quickly grew long and I could start clustering the contact people into different areas of knowledge. I selected two from each area whom I reached out to and requested meetings.

This resulted in three early stage interview meetings and three meetings for the next phase (concept validation) which were added to my process calendar.

INITIAL EXPERT INTERVIEWS

The three initial meetings with experts were open one to one discussions. The aim was to explore and understand healthcare innovation from a user perspective: What is healthcare innovation? Who are the innovators? What are their challenges and pain points? How are they supported along the process? Which innovation initiatives have been tried out and what have we learned from them? Who are the main actors in the healthcare innovation ecosystem and how do they interact? Are there specific problems I could tackle? Etc.

The approach was semi-structured interviews with open questions (Kvale, 1996). See appendix for interview-guides.

Also, I brought along a questionnaire to inspire discussion on who are the main contributors of the ideas.

The three initial expert interviews represented three perspectives on healthcare innovation:

THE INFORMANTS

Inside a hospital perspective
Rune Holdt, Innovation manager at Nyt Hospital Nordsjælland. Runes role is to choose and develop the best solutions for Nyt Hospital Nordsjælland that strives to become "the hospital of the future" (Regionh.dk, 1)

Region perspective
Thit Fredens, consultant at Welfare Innovation. Thit has moved on and works as an innovation consultant for Copenhagen Municipality, however my interest was about her work for the Region, especially where she conducted extensive research on the structure for innovation at the hospitals in the Capital Region.

Future healthcare needs perspective
Anne Danielsen, project manager at Danish Design Centre working on the health platform. Anne is running the Boxing Future Health projects where 50+ stakeholders within have been gathered in various design activities to develop three visual future scenarios of how the healthcare sector will look like in 2050.

INITIAL FINDINGS IN THE FIELD

The interviews were recorded and key learnings and quotes were noted down afterwards while listening through the sound files. They were then clustered to identify trends across the health innovation sector.

One theme that ended up dominating most of the discussions was innovation deriving from inside the hospitals. Already when filling out the questionnaire there was agreement across the informants that this is a theme that deserves to be explored further.
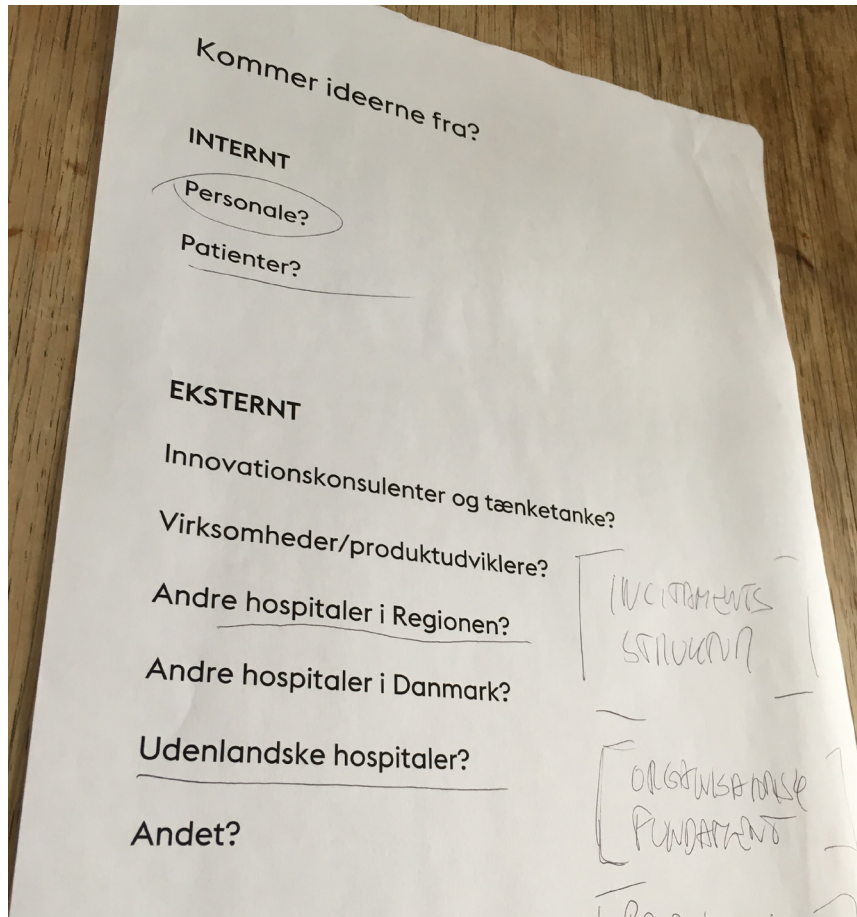
From a service systems design perspective, it is more interesting to consider the innovation from inside the hospitals. Reason being, that hospitals are holistic systems that incorporate all the core service elements; the patients and hospital employees (users) are enrolled in interactions (touchpoints) involving specific practices, procedures and technology (systems) to keep the patients alive and healthy (service goal). To the contrary, innovation from outside hospitals is more linked to the field Product Design.

I could identify five main learnings from the research that supported this interest in hospital innovation and why it makes sense to focus my attention to this theme.

1. Hospitals and its departments work autonomously and are a product of traditions and habits plus the composition of employees.

2. There is very little openness and collaboration about innovation between hospitals in Denmark.

3. There is limited organizational structure or support for innovation in Danish hospitals.

4. Best innovation ideas derive from inside the hospitals. They are based on actual needs and easy to implement.

5. Inside the hospital innovation is initiated and carried out by enthusiastic employees driven by intrinsic motivation.

In the following paragraphs, I will present and discuss the findings within each cluster of the key learnings. It also includes quotes from interviews conducted during later phases as I further tested the initial assumptions that the service is based on. One of the informants requested anonymity. Each quote are therefore not linked to the name of the informant.

1. Hospitals and its departments work autonomously and are a product of traditions and habits plus the composition of employees.
One of the interviewees described the hospital practice like this: *"In other industries, things are rectified and aligned. However, practice in hospitals are based on how we have done things until now and how the leading doctor has defined the workflows the past 12-15 years".* In other words, the hospitals are very locked in their traditional way of working rather than thinking in improvement potentials. It is not a given that efficiency and patients experience have even been considered during the development as doctors are very focused on their specialty.

All interviewees described clinicians as very busy individuals who think inside their own specialty instead of the department or hospital as a holistic system. The autonomous approach is not only limited to the specialties as one then would expect that the practice is rather similar within specialties: *"The general mentality across the medical personal is that 'we do things in a certain way here. In Odense [or any other hospital] they do it in other ways that are completely different from here".* They therefore operate as very small, rather independent units. Another informant confirmed the insight and reflected further on it: *"The way you organize your department is based on traditions you inherit from your predecessor and then you might add one or two adjustments. It is a sort of apprenticeship (...) This might have been sufficient when we had those small provincial hospitals. Now the hospitals are much larger and we know much more. Still no one looks at them with a production, logistics or service management perspective".* In other words, the world surrounding the hospitals has seen a great and exponential development while the hospitals seem to be stuck in outdated traditions focusing on specialized improvements rather than an optimal service flow across the hospital system.

2. There is very little openness and collaboration about innovation between hospitals in Denmark.
When asked about knowledge sharing across hospitals in Denmark all interviewees answered that this is very rare. *"Hospitals are extremely protectionistic so the openness is rather limited. It is partly due to the competitive culture and*

big egos". All interviewees mentioned the competitive culture as a big barrier to sharing knowledge across hospitals. However, they subsequently reflected, that this culture is changing with a younger generation of doctors who seem more open to share and collaborate. One informant recognized that there would be great benefits to increased sharing of innovation: *"There is not a culture of looking to other hospitals and saying 'those are really great maybe we can get inspired'. Reason is that hospitals are very different - at least for the employees - but for the patients it would be very great to strive towards recognizable solutions. That the hospitals learn from each other."*

The informant further reflected on the lack of communication channels between the hospitals: *"It is not so difficult for the ideas to travel internally in a hospital, it is more difficult to source them from outside. However, that is also because there are no communities where you share those things. Obviously there are some professional communities focusing on specialties, however it would be beneficial to combine various specialties and disciplines."* Another informant mentioned that the communities do exist to a degree but the output and quality could be better: *"At the moment there are various knowledge communities and network groups that also focus on [healthcare] innovation. It is simply very time consuming, since you are flooded with information you do not need."*

3. There is limited organizational structure or support for innovation in Danish hospitals.
According to the Triple Helix Health Innovation model in explained on page 24 it is the Copenhagen Healthtech Cluster that should be initiating and facilitating the health innovation. However, according to the interviewees there are very limited cross collaboration: *"Copenhagen Healthtech cluster has now excisted for three years, yet I don't think many people in my industry know what they are doing. It can of course change, but it is still blurry to me. Especially because there is a parallel organization in Capital Region so who is doing what? We rarely have anything to do with each other."* Early in the research phase it became clear that very little resources are allocated to hospital innovation. It seems to be an under prioritized area in Capital Region: *"At Herlev Hospital – the 2nd largest hospital in Denmark – only one employee is allocated half of his time to innovation. It needs to be taken more seriously to optimize the hospitals*

and an organizational structure is necessary. To build units focused on innovation depends on the hospital direction. At the moment it is not prioritized where I am. One can do hobby crafting solutions to the problems in their department for some years, however you get to a point where this no longer is enough."

According to the informants there are no commonly agreed frameworks of how to innovate the hospitals: *"You need to supply a framework and structure, then I'm certain the great ideas will follow from practice. They will not just arise without facilitation, though."* An informant explained their personal experience with hospital innovation: *"Innovation in hospitals are often a result of a leading doctor who attends a conference and buys a few products with the assumption that it can cover some needs that he or she has experienced in practice."* Another informant supported the hypothesis of a random approach to innovation: *"The development of this hospital is not coordinated. I am working for one department and prioritize my energy here. All other development are decentralized and you do what you feel for at each department."* The consequences of this random approach often lead to inefficient use of resources. An informant exemplified this in the following words: *"We have seen that there have been large investments in equipment that is never being used as they have not been implemented. I have seen so many products in different departments that are just stored in a closet somewhere and never used as they do not match a real need. We need to be better in prioritizing what we bring into our hospitals."* In other words, the result of this random approach to hospital innovation is human capital and money wasted or at least spent inefficiently.

4. Best innovation ideas derive from inside the hospitals - based on actual needs and easy to implement.
Hospitals have realized the advantages of starting the hospital innovation processes inside the hospitals: *"People who work with the processes and equipment every day naturally have great ideas of how this is done. So you need to ignite those ideas and not just sit and wait for external suppliers to knock on the door. The wealth of ideas is there and it is also much cheaper if the hospitals start prototyping themselves."* Another informant supported this notion: *"If we go and define the problems and what we need, we are sure to get a real need covered. When innovators from outside approach us they don't offer things that we don't need but it is designed by someone who are not aware of the internal*

processes. They approach with a prototype where the fundamental elements are difficult to adjust."

The informant further stressed that it shouldn't just derive from inside the hospital, the optimal innovation process is carried out by the people who are directly involved in the current practice: *"We are not convinced that someone who sits in the top in an innovation unit knows exactly how it should be done but we can provide some methods and help the initiators that way."* In other words the actual healthcare professionals should play the main roles in the hospital innovation processes (alongside with the patients). There are a large pool of untapped competencies and know-how inside the hospitals: *"Hospitals are simply a bigger driver of innovation than they are allowed today. They contain a large operational machinery which is so specialized and with a broad selection of professional competencies so from a classic innovation- and development logic it would be odd to let only external partners innovate the area."* The internal competencies are simply not fully utilized for hospital innovation.

5. Inside the hospital innovation is initiated and carried out by enthusiastic employees driven by intrinsic motivation.

An informant explained the process of innovation inside the hospital as following: *"We have seen that innovation actually is driven by a few passionated employees who urgently wants to change something. When a fire starts in them, my task is to run to them and blow to this fire".* Asking more in detail about the innovators inside the hospitals another informant reflected on their conditions: *"It's actually really bad, cause if you are a passionate innovator then you hurry and find a new job where you will get recognition for your initiatives. In hospitals you are not acknowledged for it. It's even difficult to cover the hours you need to use for the initiatives so new structures are needed."* The conditions for innovators inside the hospitals are far from optimal. In most other industries time and resources are dedicated to evaluate and optimize the organisation's processes and systems. This is not the case in the hospitals; it depends on extra hours invested by enthusiastic employees.

At this point the research scope was directed into further exploration of the innovation conditions inside the hospitals. A brief introduction to the hospitals in Denmark is therefore necessary.

HOSPITALS IN DENMARK
The Danish healthcare system is universal and based on the principles of free and equal access to healthcare for all citizens. (Ministry of Health 2017). Hospital care in Denmark is free of charge for the patients. The five regions in Denmark are responsible for providing hospital treatment to the people living in the region and emergency treatment for all persons in need. The regions organise health services for their citizens according to regional needs, and the individual region may adjust services within the financial and national regulatory framework, enabling them to ensure the appropriate capacity (ibid.).

The hospital sector is currently undergoing a complete restructuring. An important part of this transformation is the merging of specialised functions into fewer and larger units. The purpose of this centralised planning process is to improve and ensure quality and continuity of care, while at the same time ensuring efficient use of resources. The specialised regional functions are, depending on the speciality, distributed among one to three hospitals per region, while highly specialised services are located in one to three hospitals in the country. Denmark is investing EUR 6.4 billion in 16 new hospital projects (ibid.). These projects include greenfield projects as well as extensions and modernisations of existing hospitals.

According to The Ministry of Health in Denmark the modernised hospital infrastructure is expected to contribute significantly towards the vision of placing Denmark among the most attractive countries in the world for developing, testing and manufacturing healthcare solutions based on strong research, fast implementation of innovative new technology, good conditions for public-private collaboration and a well-functioning, development-oriented home market (ibid.).

HOSPITAL INNOVATION IN DENMARK (CAPITAL REGION)
To better understand hospital innovation in Denmark first step was to map the health innovation ecosystem. Which stakeholders are involved in healthcare innovation in Denmark and what are their roles and interaction? A surprising large number of actors and organisations came up during the research. The full list can be found in the appendix. It quickly became obvious that within each region, the actors have formed very different systems of interaction with no harmonised procedure.

Based on these insights I made the decision to focus on researching the Capital Region as it is the region I myself am located in and therefore have easier access to. There are approx. 1,7 mill inhabitants in the Capital Region which counts to 30% of the Danish population (godtsygehusbyggeri.dk). Additionally, the Capital Region defines themselves as the innovative region in their hospital strategy vision: *"Capital Region is the green and innovative metropol with large growth and life quality as well as a coherent healthcare provider on international top level."* (Hospitalsplan 2020, p. 15) The Region Capital considers innovation *"as a necessary and important tool in order to develop the health services of the region and to generate regional growth".* Their ambition is to *"create an innovation culture in the region and to ensure increased and faster implementation of good ideas."* (ibid.)

When studying examples of healthcare innovation there was no structure of whom to involve, partner up with or seek information from. It appeared to be very random how the innovation traveled from idea generation to implementation and who was involved during this process. Therefore it did not make sense to map the stakeholders in a classic stakeholder wheel. Rather I chose to group them based on the political layer/hierarchy they operate in, ranging from research and education, municipal level, regional level, national level and international level. Focusing on the somatic hospitals of Capital Region I gathered an overview of all the actors (See next page).

The hospitals are placed as a wheel of actors in the middle. The pink iconography shows their internal innovation ressources. The different elements will be further explained on the next pages.

Hospital Innovation Ecosystem
For somatic hospitals in Capital Region, Denmark

■ Innovation unit

▲ Department-driven innovation

International actors/network	(EIT) European Institute of Innovation & Technology			Institute for Healthcare improvement			(NI) Nordic Network of Test Beds	

| National actors/network | Center for Research & Innovation | Forskningsrådet for Sundhed & Sygdom | Hospitals in other regions | Medtech innovation | Danish Society for Patient Safety | Welfare Tech | Triple Helix Health Innovtion | |

Regional actors/network

Center for Regional udvikling - Vækst & Viden

Sund Vækst
- collaboration between Copenhagen Municipality, hosptitals, private companies etc.

VihTek
- Testing, developing and implenting welfaretechnologies at hospitals in the region

Rigshospitalet ■ ▲

Nordsjællands Hospital ■ ▲

Herlev/ Gentofte Hospital ▲

Bornholms Hospital ■ ▲

Amager/ Hvidovre Hospital ▲

Bisbebjerg Fre-deriksberg Hospital ▲

Copenhagen Health Innovation
For health professionals, educators & students

Copenhagen Healthtech Cluster
For Business professionals

Copenhagen Centre for Health Technology
For scientists

Municipal actors/network

Velfærdsinnovation, Københavns Kommune

Research & Education

Scion DTU

Sundhedsinnovation (Copenhagen University)

SUND hub
- coaching innovative students

Metropol

Hospital innovation outside the hospitals
Health innovation in Denmark is organised via the Triple Helix Health Innovation clusters. They are illustrated in the ecosystem by the three vertical lines as they include organizations from all layers except for the international layer. The clusters are organised to ensure a powerful innovation environment across research, education and business within health innovation. The different areas they cover are illustrated below:
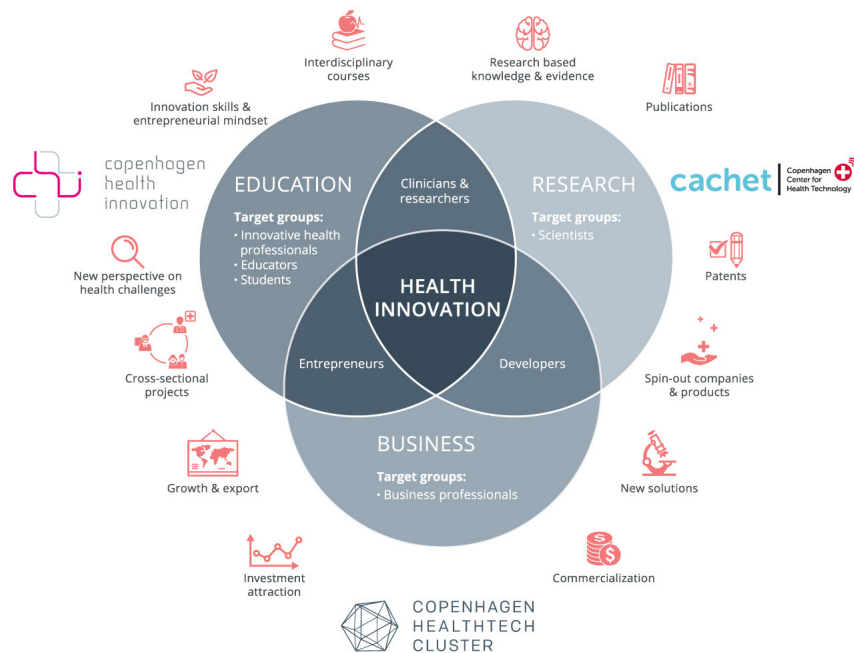
Also, there are various companies and research institutions focused on innovating the health industry which have direct impact on the hospital practice, e.g. the development of new syringes, scanning machines and hospital beds. The vast majority of innovation is from the first category of Hertog et al.'s types of innovation: Technological and clinical innovations.

The Capital Region provide the "Én indgang for Medico" [One access for Medico] that guides medico companies to the most relevant clinical environment within the healthcare institutions to perform tests in and establish collaboration with (regioner.dk)

Hospital innovation inside the hospitals
Hospital innovation inside the hospitals is carried out autonomously in each hospital. As shown in the ecosystem on previous page, the innovation units inside hospitals are scarce.

Despite the Capital Region's innovation ambitions, several informants mentioned that innovation is not prioritised in comparison to other regions in Denmark. Only half of the hospitals have an innovation unit; Rigshospitalet, Nordsjællands Hospital and Bornholms Hospital:

Rigshospitalet: At Rigshospitalet only one person is allocated full time to innovating the hospital, their Innovation and Organisational Development Manager Peter Aagaard Nielsen. The dominating approach is based in the initiative Ideriget, an idea competition that encourages hospital staff to submit their ideas for improvement where after the winners are allocated time and resources to further explore and develop the innovation. Organised under Rigshospitalet is VihTek; a knowledge center for welfare technologies who works to support the clinical practice in Capital Region and ensure it can provide the service needed in the future by the use of welfare technologies. Vihtek aims to create an overview of welfare technology solutions as well as user tests and workshops.

Nordsjællands Hospital: Linked to Nordsjællands Hospital is the Nyt Hospital Nordsjælland that facilitates building the new hospital that will open and start taking over for the current hospital operations in 2021. The NHN team explores new and innovative hospital design and solutions to identify the best possible solutions suitable for future needs in that current area. The NHN team consist of 20+ innovation specialists and project managers and their approach to innovation is founded in service design. NHN recently opened a co-design lab, Nordic Health Lab, that invites companies to test their health-

care solutions at the Hospital (Mandag Morgen 19 maj 2018).

Bornholm Hospital: From 2016 Bornholm Hospital got the status of being a development hospital. It is a three year project implying that the hospital have full autonomy to test new methods and practices focused on what brings most value for the patients (Udviklingshospital Bornholm, 2016). Involving patients, citizens, employees and other relevant stakeholders through workshops, feedback meetings, interviews etc. has been a substantial part of the testing approach.

For patients, various platforms exist to gather critique of current hospital practice as well as actual innovation ideas. What happens to these ideas is not transparent and according to the informants they very rarely see the results.

How knowledge is shared across the hospitals
The hospital practitioners are connected through various networks and communities across the hospitals, e.g monthly meetings to discuss differences and potential optimization. Linkedin is another popular media to connect peers within specialities etc. However, as the informants problematized, these fora are all focused on clinical specialities rather than innovating across the system. An initiative worth to mention however, is the: "Godt sygehus-byggeri" [New hospitals in Denmark] (www.Godtsygehusbyggeri.dk) focused on sharing knowledge about the new hospitals that will be completed in 2025. They run a facebook page sharing videos to the general public, a yearly knowledge sharing overview is published and yearly networking meetups are arranged for actors involved in building the new hospitals. Still though, there are no fora to share knowledge of how current hospitals are improving their practices and facilities.

PROBLEM IDENTIFICATION
As described in the chapters above open innovation do exist across the healthcare sector and develop great new products and practices. However, it often happens outside the hospitals where practitioners are invited to participate in simulations. According to my informants however, it is the innovation deriving from inside the hospitals that gives best results and are easiest to implement. At the moment it is not possible for the hospitals to follow each others innovation initiatives and share knowledge and experience. There is limited support in fostering, managing and designing innovation inside the hospitals. The lack of support and structure for hospital innovation results in inefficiencies and waste of money. How can the ideas arising inside the hospitals be better supported? Is it possible to develop innovations that can be applied to more than one hospital and thereby reap large scale benefits? It demands a greater openness and collaboration between the hospitals. And it demands a smarter system for collecting, maturing and perhaps co-developing the innovations together. From a service design perspective there is an immense potential of applying a holistic view to the hospitals, with the aim of breaking down assumptions and traditions and replacing them with improved user experiences and efficiency.

FINAL PROBLEM STATEMENT
The following is the final problem statement which has been refined throughout several iterations:

How might a service system support innovation actors inside the hospitals of Capital Region when improving their hospital practice together?

Innovation actors are here defined as hospital staff who are initiating, managing or participating in an innovation process. It also includes e.g. clinicians and nurses who are invited to give their input in a design process, even though they have no prior experience with or knowledge about innovation. Basically it can be any hospital employee with knowledge that could contribute to creating new solutions, e.g. a nurse, receptionist, surgeon, porter etc.

Limiting the service to this group of actors has several advantages. First of all it was a matter of the time scope of this thesis, i.e. prioritising to achieve a sharp focus with deeper understanding of a smaller group of users rather than a superficial guesstimation of a large and diverse group. Secondly, my service concept validation (see below) showed that the potential users have increased trust in the concept if it is limited to users that they can relate to and whom they share interests and intentions with, rather than including actors like e.g. pharma/tech companies with commercial intentions. Thirdly, the selected group of users have a common language/frame of reference which can be used for the service, hereby decreasing misunderstandings across the users.

On a later stage, the service concept can be scaled up to include a more diverse group of users, hereby building closer ties across the healthcare sector. This is, however a task outside the scope of this thesis.

DESIGNING A SOLUTION

During the development phase various tools from the service design toolbox were used to define and refine the service concept based on the insights I had gathered among the potential users of the service.

CONCEPT PRESENTATION

The initial idea for the service came up during one of the early expert interviews. It was during my meeting with innovation manager at Nyt Hospital Nordsjælland Rune Holdt when we discussed the frustrations he had of the non sharing cultures in the hospitals and how resources are wasted because of it. He shared an idea of an innovation platform and we continued discussing what potential this could have.
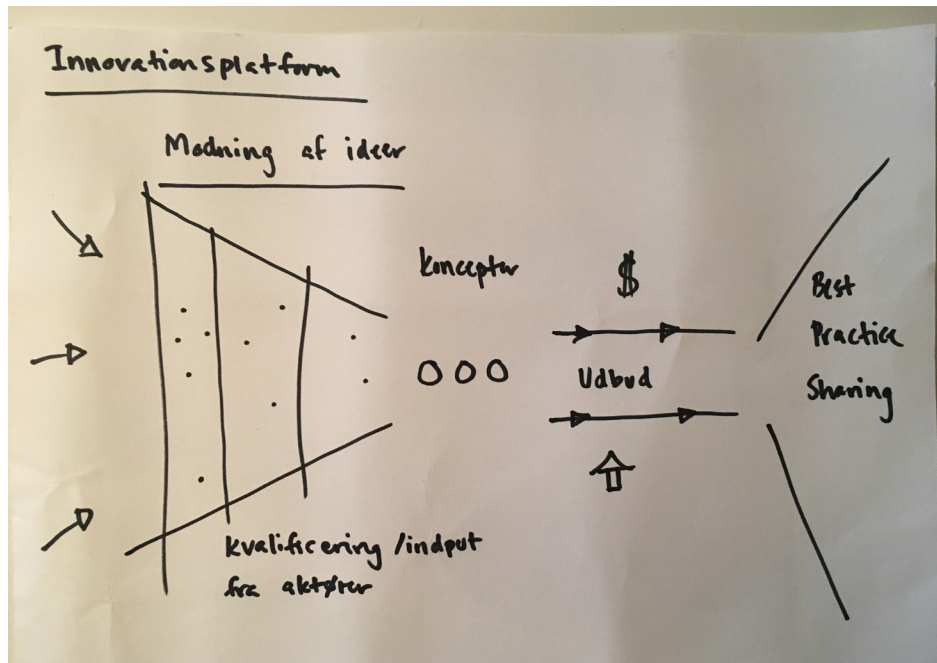
Rune Holdt sketching an idea for an innovation platform.

In short, the idea was to create a platform for all actors involved in healthcare innovation for them to share knowledge and experience. This way a large pool of ideas could be collected and discussed by peers and experts across the platform and shaped into early concepts. The concepts would be transparent for the industry hopefully resulting in that potential investors and companies would come together and complete the innovations. Rune sketched the idea (see drawing).

It seemed to be a great starting point; to design a service meeting real needs and interest in the hospital innovation arena. In addition, it seemed to have the potential of dealing with all five key learnings and the challenges deriving from them. However, there was a great task ahead of analysing the idea further. Who should be the main users? What are the motivations to use it? What content should be prioritized and what would be an optimal user experience? What are the frontstage and backstage processes in this kind of service? These questions (and many more) I wanted answers to.

Sometimes it is an immature service idea that inspires you to define a core problem. This was the case here. The right framing of the problem, however, should be the beacon/guiding star of the design process rather than holding on to the initial idea. The final service solution presented in this thesis is very different from the idea sketched above. However, the sketch was essential for defining the problem and looking into the potential of a sharing platform for innovation in healthcare.

Before starting the design of the service I brainstormed on the potentials of the service concept. This was done using a classical tool from the Lean philosophy toolbox called Kiplings checklist.

KIPLING CHECKLIST

The Kipling Checklist is simply asking Who?, What?, Why?, When?, Where? and How? It is an incredibly useful tool for quick analysis, as it provides depth and breadth to the problem-identifying and -solving stages (St. Andrews Lean Consulting). It enables quick understanding of a concept or problem.

When using the Kipling Checklist at this point it was simply to put some shape to this initial idea that potentially could be further designed to answer the problem statement. However, with the awareness that the concept could change during iterations on later stages of the design process. At this stage the service idea was broad and focused on all actors in the healthcare ecosystem. I did not want to miss out on potential aspects of the problem where it would be beneficial to divert my full attention to.

WHAT: Designing a service/platform for...
 - Sharing improvement initiatives/innovation/best practice across the
   healthcare innovation ecosystem
 - Maturing ideas via input from peers
 - Enabling co-creation across sector
 - Strengthening healthcare sector collaboration nationally
 - Defining/testing/refining ideas in a design thinking framework
 - User Driven innovation
 - Open innovation
 - Enabling scalable solutions
 - Aligning improvement roadmaps
 - Sharing learnings from implementation

WHY: Healthcare innovation actors often work in silos when they innovate and test new ideas. The many challenges in the healthcare sector demand a more efficient way of developing and testing new services, products and concepts. Numerous innovation associations/clusters/networks are existing outside the hospitals. However, there are no transparency of current or future innovation/improvement projects inside the hospitals. Departments within hospitals deal with similar challenges/opportunities and could benefit from each others work/perspectives/collaboration, hereby gaining a bigger sum of brainpower, saving resources and enabling a development of best practice. Open innovation and co-creation are not fully explored across the hospitals.

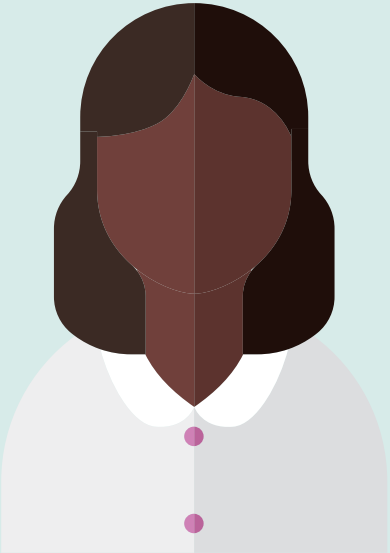**WHEN:** Option for constant, spontaneous interaction

WHEN: Digital platform

HOW: The service should be co-designed with users. Taking into account: user needs/behaviour, current innovation processes and dynamics, political arena/agendas, stakeholder landscapes.

PERSONAS

Personas were developed on a very early stage of the design process after the service idea was sketched down for the first time. The aim with this was to bring them along the whole journey of designing and include them as much as possible when discussing and challenging each element of the service.

Personas are fictional profiles developed to represent a particular group based on their shared interests (Stickdorn & Schneider 2011 p. 178). They represent a "character" with whom the design team and clients can engage. The aim is to comprehend the wants and needs of real people and include them during the whole design process. The personas presented below was designed to represent different user groups of the service and they were developed from the research I had gathered about the hospital innovation ecosystem. The personas have been refined during several iterations based on input from interviews and co-design session.

Becky Magnussen
Age: 37
Innovation Manager at Bornholm Hospital

What is innovation?
"Innovation is key to meet the health demands of tomorrow. With new technologies and service design we can increase quality and efficiency in the Danish hospitals. The aim is to improve the patient experience as well as the working environment for all hospital employees."

Innovation drivers
 - Innovation mindset, methods and skills
 - Improved patient experience
 - Cost efficiency
- Process efficiency

Innovation barriers
 - Limited resources. Many ideas battle for her attention
 - Sourcing and prioritizing ideas
 - So structure for scaling successful innovation
 - Bureaucracy and limited structural support from organization

Mario Rose
Age: 49
Radiologist at Rigshospitalet

What is innovation?
"I have been involved in several innovation projects and I am happy to give my input when needed. It is fun to help molding the results and see the benefits for the patients after implementation. I believe my department gives the best radiology examinations in Denmark"

Innovation drivers
 - Improved patient experience
 - Pride and recognition
 - Open to trial and testing
 - General interest in new technologies

Innovation barriers
 - Limited time
 - Navigation: which projects should he work with?
 - Repetition: delivering same advise to several entrepreneurs, when contacted.
 - Lack of innovation frameworks and tools

Astrid Laugesen
Age: 28
Nurse at Hvidovre Hospital

What is innovation?
"Innovation is initiatives with the intention to make us more efficient. We are running fast every day and I am grateful if some sort of robot can help us and make the hospitals smarter. I am just not sure I can contribute with anything as I do not know much about new technology."

Innovation drivers
 - Improved patient experience
 - Process efficiency

Innovation barriers
 - Hierarchy
 - Traditions and habits in the department
 - Limited time
 - Lack of innovation frameworks and tools

Simone Palmer
Age: 64
Senior surgeon at cardiovascular department at Herlev Hospital

What is innovation?
"Innovation is 'smart ideas' developed by people outside the hospital who does not understand the actual practice in my department. It is forced on us from above until they realize that it does not fit here and then they try out their next smart idea. It steals my time and focus from what is really important: my patients."

Innovation drivers
 - Improved treatment quality
 - Pride and recognition
 - Improved equipment
 - Improved patient experience

Innovation barriers
 - Limited time
 - Traditions and habits in the department
 - Focused on research within her speciality
 - Still adapting to Sundhedsplatformen changes
 - Lack of innovation frameworks and tools

The information to define each persona has been carefully selected as it is not so interesting for example to know about the character's personal life as the service will be used in a work context. It is however, vital to explore and understand their relation to innovation and what the drivers and barriers are in this context. This information will reveal the openness of each user group towards the service and help empathise with what they will need in certain situations.

The personas represent different age groups as the research so far had shown that older groups often are more reluctant to open innovation than younger generations. Half of the personas are used to working with innovation, one being an innovation manager and the other one being an enthusiast who devotes extra energy to innovation. The other two personas are not experienced with innovation, one being optimistic towards the benefits and the other more pessimistic towards it. Information about the target group that I gathered throughout the whole design process were built on the personas

and made them continuously more whole.

Printouts of the personas were brought along and introduced to all the people I met to discuss the service with and eventually they almost felt as close as relatives. The personas are also embedded in all the design tools that were used after this point of the design process, e.g the scenarios, the service journey, the value proposition, blueprint etc. This enabled me to consider the wants and needs to the service from different perspectives and resulted in a large share of the improvements that were made throughout the design process.

CONCEPT VALIDATION
I wanted to test this early stage service concept with experts and potential users. This was done via three individual sessions with two experts in hospital innovation and one professional who could be a potential user. The sessions focused on exploring three possible service scenarios that I had designed for the purpose. As I was still diverging and therefore open to new directions for the concept, the sessions also included open questions about healthcare innovation and how it is practiced from their perspectives. The concept was validated with three experts in the hospital innovation field:

Peter Aagaard Nielsen
Innovation and Organisational Development Manager at Rigshospitalet

Nana Levann
Nurse in breast surgery department at Herlev Hospital + resource person for Sundhedsplatformen and generally involved in all initiatives to improve the department.

Thomas Hammer Jakobsen
Director of Copenhagen Healthtech Cluster and partner in Copenhagen Living Lab

Thomas Hammer Jakobsen validating concept.

The duration of each session was between 40 mins and 1h45min.

EARLY SCENARIOS
Design scenarios are hypothetical stories, created with sufficient detail to explore certain aspects of the service (Stickdorn & Schneider 2011 p. 184). Scenarios can be used during most stages of the design process and the aim is to provoke discussion on what is working well and whether it is realistic. I chose to base the scenarios on text only as it was still very early stage and they should be relatable amongst a diverse group of pretotyping participants, each getting their own visuals when reading the scenario. However, I incorporated the personas to give some authenticity.

For the concept validation sessions I designed three scenarios that would

showcase different aspects of the service from different persona perspectives. It should help exemplify the benefits and service flow in a case the experts could relate to. In the text I had purposely left some open spaces marked with "...". The aim was to let the participants reflect on the case and help constructing realistic cases.

Studying scenarios during concept validation.

Scenario 1

Innovation manage[...]
to reorganize the ...
outdated. She look[...]
and sees that a sim[...]
a restructuring in t[...]
after 2,5 years. This[...]
ciently.

When presenting t[...]
ahead as it ...

She discovers on O[...]
hospital are lookin[...]
department. Becky[...]
hospitals have com[...]
be the Rotterdam [...]

After implementin[...]
Rotterdam case on[...]
a supplier of equip[...]
promising on quali[...]
Open Innovation p[...]

Scenario 2

Radiologist Mario a[...]
... for the past year[...]
as an Innovation e[...]
tech device that m[...]
tweaked to the pu[...]

Mario looks at Ope[...]
hospitals in DK has[...]
He reaches out to b[...]
out to tender and s[...]
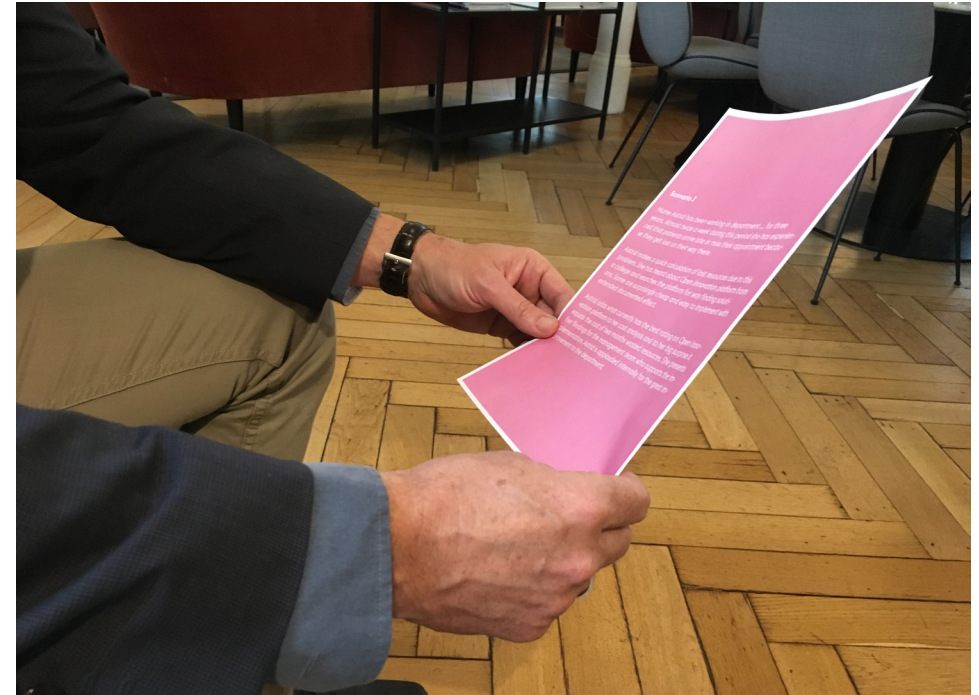team by prototypi[...]

The result is a big s[...]
Mario shares the id[...]
much credit from i[...]
cessfully implemen[...]

Scenario 3

Nurse Astrid at Hvidovre Hospital has been working in department ... for three years. Almost twice a week during this period she has experienced that patients arrive late or miss their appointment because they get lost on their way there.

Together with a friend who works in finance Astrid makes an estimated evaluation of lost resources due to this problem. She has heard about Open Innovation platform from a college and searches the platform for way finding solutions. Some are surprisingly cheap and easy to implement with extended documented effect.

Astrid adds what currently has the best rating on Open Innovation platform to her evaluation and to her big surprise it equals the cost of two months wasted resources. She presents her findings for the management team who supports the implementation. Astrid is applauded internally for the great improvement to the department.

CONCEPT VALIDATION RESULTS

I asked each participant to read out loud and give their immediate feedback. This was followed by more detailed questions about the service potentials and barriers

The scenarios proved to be a good way of explaining the service potentials and it was great to have concrete cases to base the discussion on. The open spaces initiated valuable feedback on realistic scenarios. All three experts gave examples of what specific problems the persones could be dealing with and where this could take place. The interviewees were generally optimistic and interested in the service concept as it was presented to them. Especially Peter and Nana who work inside hospitals on a daily basis could recognise the needs I had identified as well as support this type of service solution. They could both see themselves use the platform as a helping tool in their

daily work routines. Thomas however, was more critical in his feedback of the scenarios. In his view, I had ignored several substantial transaction costs, in particular the development processes in the hospital system, which he mentioned are much slower than assumed.

The main takeaways from concept validation are listed below. They have been arranged inspired by the Value Vision model proposed by Erik Lerdahl (2001) where you consider a service's characteristics ranging from the most abstract and philosophical level (Spiritual) to the most concrete ones (Product details). Within this range is the Interaction level exploring how the service will interact with its users and the concept level, exploring how the service vision will function in practice (ibid.).

The perspective reminds the service designer to ensure coherence in the concept by considering all four levels of abstraction.

Spiritual
Intention

Contextual
Expression

Principal
Concept

Material
Product
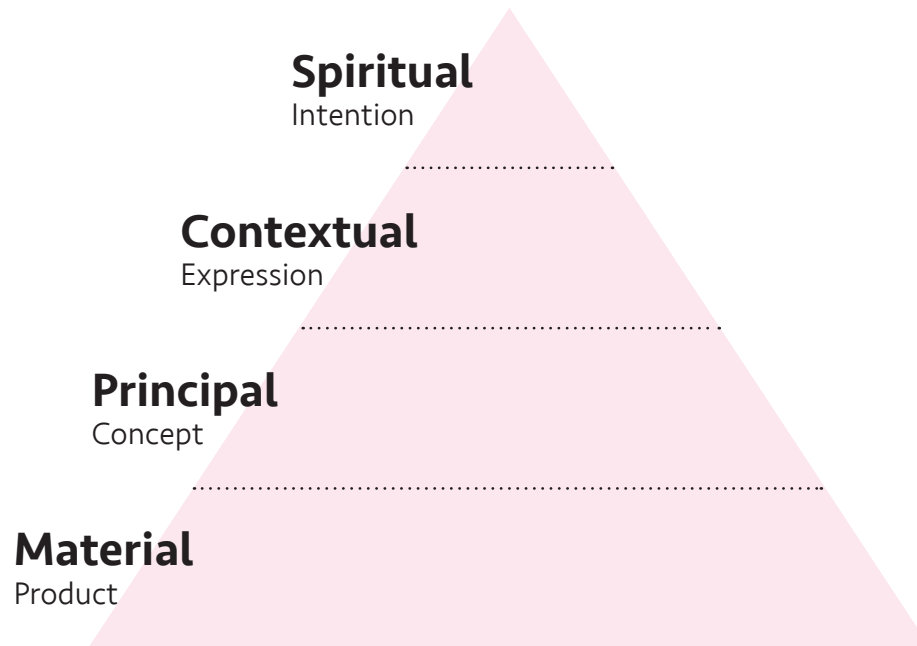
Value Vision Model by Erik Lerdahl (2001)

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Spiritual Level (intention)
- The service should be based on a clear altruistic vision that the target group supports and relates to. Maybe that the group is "stronger together".
- Aim for the service should be to develop a collective interest in the whole. In other words it should challenge the speciality focused mindsets and install an interest in the hospital as a holistic service system.

Contextual Level (Interaction)
- Carefully choose the right type of content to show on the service in the beginning. Let clinicians choose them so they are relevant, attractive, and inspiring from their perspective
- Nurses are a great group to involve (scenario 3). They have a broader profession than e.g. doctors and therefore not so specialized and important in their self vision as doctors. Doctors are problem finders more than designers of solutions.

Principal Level (Concept)
- Innovation facilitators in the health industry generally lack competencies, such as key design toolsets and methods. It is often consultants, nurses with executive education/courses or finance professionals. The service should supply them with better tools.
- Carefully consider the time perspective: when designing the service it should be taken into account that it often takes up to thirty years to change practice in hospitals.
- Prioritise to use the clinical lingo rather than the lingo from innovation management. It is easier for the innovation professionals to adopt the clinical lingo than the other way around and the clinicians will be reluctant to use the service if they cannot understand the rationale behind the lingo.

Material Level (Product details)
- Avoid the word Platform in the service name as the target group easily associates it and links it to Sundhedsplatformen, which still is widely criticised amongst the group.
- Ensure user friendliness so the user easily finds what they are looking for.

This is not the case in Sundhedsplatformen, however it is vital in this industry as time is very scarce. Aim should be to make the service intuitive and not overloaded with information.

All the above feedback was important for the further design process of the service. It is important to state, that the intention of the Value Vision Model is to define the layers yourself and you could therefore keep adding to the different layers. The way it is used above is solely with the purpose of structuring the insights based on level of abstraction. It proved to be a great tool for that purpose and helped reminding of giving each layer same amount of attention when designing the service.

CO-DESIGN SESSION

With the aim of having maximum involvement of the potential users during the design of the platform, I scheduled a co-design session with innovation manager Rune Holdt. He was the one who came up with the idea of an innovation platform during an early stage interview and I therefore wanted to fully understand the vision he had and how it from his perspective could materialise. My role was to facilitate and moderate the session to insure that it generated the type of results that could be incorporated in the next phase of the process, where the the service concept will be designed in further detail. My interest was to specify the service needs from the users and what it implies for the service journey.

The duration of the co-design session was 2h15mins and was held at Nordsjællands Hospital in a large meeting room. The intention of the meeting here was as well to get a feeling of the working environment the innovation team spend their daily work hours in. How are messages communicated? Which posters are hanging on the walls? What is drawing their attention? How is the atmosphere in regards to tone of communication, office interior etc.? Is it creative, colorful and casual or formal, clinical and professional? My senses were trying to actively observe and capture these details that could help me shape the service concept to make it as relatable and appealing to the target group as possible.

The agenda for the session was to start out by presenting my early findings, the service delimitations and the service goals. Then I gave a short presentation of the personas for us to use during the session. For the session I had prepared a large print out of the personas and a few service journeys with no content. I gave Rune the task of filling in the journey details focusing on one persona at the time.

SERVICE JOURNEY EXERCISE

A service journey map provides a structured visualisation of a service' user experience. The touchpoints, where the user interact with the service, is defined and connected together in a visual representation of the overall experience (Stickdorn & Schneider 2011 p. 158-159). Often it is backed up by an emotional journey to explore the feelings the user goes through during the service experience. The service journey can be used for many purposes, e.g. identifying problem areas and opportunities for innovation, as well as it allows for easy comparison to other services.

With the service journey tool I wanted Rune to go through each step of the user experience and define what he envisioned as an optimal user experience. The information in the prepared journey was therefore limited to the first headline of the stages. All other boxes were left blank so that Rune could fill in information and decide the duration of the stages, what the touchpoint with the service should be and what emotional journey this would trigger for the user (See next page).

I had brought along post its to write the information on to allow for changes to be made during the session and to ensure that all information did not have to be fully thought through before it was added to the journey map. My role during this process was to guide and encourage the design progress, ask for details, challenge the information given and compare it to the information and assumptions I had at this point of my design process.

Service Journey
Open Innovation Platform
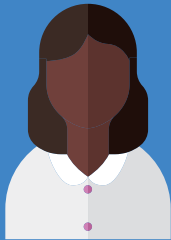
Becky Magnussen
Age: 37
Innovation Manager at Bornholm Hospital

What is innovation?
"Innovation is key to meet the health demands of tomorrow. With new technologies and service design we can increase quality and efficiency in the Danish hospitals. The aim is to improve the patient experience as well as the working environment for all hospital employees."

Service Objective

STAGES	AWARENESS			
DOING				
THINKING				
FEELING				

CO-DESIGN SESSION FINDINGS

It was clear that Rune had been working with these kind of design tools before as he immediately understood the task. He chose to start with the persona Becky as she is an innovation manager at a hospital as well so he could easily relate to her agenda, needs, wants, pain-points, routines and behaviour. He quickly came up with a realistic case of Becky wanting to look into front-loading as this is a very hot topic within health innovation at the moment. He thereafter imagined how the service could give optimal support during this journey. We ended up going into such great detail of discussing Becky's journey that no time was left for the other personas. I however made the decision to not rush through it as the quality of information about this part of the target group was phenomenal and it would be better to explore other parts of the target group on later stage. The other personas were drawn into the conversation now and then to reflect on their needs and attitudes in that particular context. Throughout the session the atmosphere was very light and friendly, yet focused and result driven. We were both happy to have stocked the room with coffee and snacks so the creative energy could last till the end.

Many insights about the complex environment hospital innovators operate in were shared and discussed during to session. The following is selected insights that will have direct influence on the shaping of the service concept.

During the session we could further specify the primary service needs:

1. **A marketplace for pitching problems and sharing knowledge:** Sourcing information on innovation projects on other hospitals. Contributing with own learnings and experience. Getting direct feedback on ideas from relevant peers and experts within the field. Co-creating ideas via dialogue.

2. **Leapfrogging on others work/research and efforts:** Learning from others experience and reusing element to own hospital, hereby reducing time consuming processes. Support opportunity mapping by providing an overview of innovation ideas and their benefits.

3. **Toolbox:** Access to innovation process frameworks, methods and tools e.g. a roadmap to run your design sprint. Aim: shared discourse and accelerated processes.*

*According to Rune, current hospital innovation models and frameworks (e.g. Forbedringsmodellen and Triple Aim) are inadequate for radical innovation. They can be applied to foster incremental innovation, however according to him it gives a wrong level of ambition which results in slow development. The hospital innovation facilitators simply do not have the necessary methods and toolbox.

Designing Becky's service journey
Becky's expectations from her environment is that she is an innovator/ solution finder and facilitator. Her incentive to add content to the service is her need for profiling within the field of hospital innovation, strengthen her network, take part in a professional community, expose herself and become more attractive when applying for jobs in future.

See an image of Becky's journey on next page.

Service Journey
Open Innovation Platform

Becky Magnussen
Age: 37
Innovation Manager at Bornholm Hospital

What is innovation?
"Innovation is key to meet the health demands of tomorrow. With new technologies and service design we can increase quality and efficiency in the Danish hospitals. The aim is to improve the patient experience as well as the working environment for all hospital employees."

Service Objective

FRONTLOADING
- Research i feltet
- Strategic alliances
- Share ressources
- Identify technology

Vision altruistic perspectives

Externally defined Calls ??

STAGES

AWARENESS → → PROFILING → GO DO →

First interaction

DOING

IP innovation network

Browser Homepage

Browsing - Value? Painpoint

Profile Setup

insight - potentials

- create support
- mobilize

Research Phase

Needs: What is implemented / time schedules

How is info filtered - she needs the 5 most relevant for her.

Interaction - mail addres

Formulate "challenge"

Help! Pitching / Template

Commenting on other projects

- Timing!

Access: Roadmap frameworks

Skype meeting
Slack success

status scores?

THINKING

is this innovative enough? Edgy

Can this be used in my context?

I need to expose myself. What if noone answer?

Should I share this? competition

FEELING

This looks great / Design

These users are high level

The following sums up the journey steps defined during the co-design session (See image on previous page). It is followed by co-design results on how the different service elements should be designed. This includes ideas, user profiles, roadmaps and Open Calls. Eventually the identified pain-points are presented.

Service journey objective: Strategy for front-loading (reason for choice: hot topic within healthcare). Becky's interests: How are other hospitals front-loading? What questions and ideas have other users added?

Becky's journey steps:
- Awareness: Awareness of the service will spread fast in the innovation cycles as there are great promotion opportunities.
- First interaction: Browsing the website. Becky will explore: what are the underlying values? Can she identify with this?
  Look and feel goals: impressive/professional/ambitious/informative, yet not too dry. Designed and aesthetically pleasing.
- Set up profile. Becky's aim is to seem attractive/professional in the innovation network.
- Understanding a problem: Becky will explore what projects are there. What are the levels of ambition? Can she learn and get inspired here?
- Scoping: what does she want to change exactly? Becky will explore: Similar projects: what are other hospitals doing? How are projects categorized/ structured? Becky need to be helped into a sphere to qualify her problem.
- Finding mandat internally. Becky needs to create internal support and mobilisation and need helping tools for it.
- Detailed research: Becky will explore concrete details on projects that have been completed.
- Matchmaking/strategic alliances: Becky will propose a problem framed via three answers to specific questions and explore who are interested in solving similar problems with the aim of forming a strategic alliance.
- Skype meetings and projects managed in Slack
- Implementation
- Share case (receive likes, comments, scale to other hospitals)

The ideas
A onepager accompanied by 90 sec video.
Same template for onepager including e.g. headline, introduction timelines, results, value for patients, value for staff, cost savings, tme savings, product innovation, process innovation, core issues, learnings, collaborators, suppliers and contact info with profiles.
Each idea should have a threads of discussion.
Hashtags (max 100 predefined). E.g. #waiting room.

The user profiles
A simple bio (name, profession, experience)
It should show the service activity and potentially give scores that gives status. Becky can link to her score when applying for next job, showing that she has managed 5 projects and co-participated in 37. It becomes her valuta.

The Roadmaps
All involved hospitals should fill out and continuously update a roadmap for their upcoming innovation projects. Templates should be delivered from the service. Roadmaps should include 1) which projects are scheduled at the hospital and 2) which projects are planned to be further explored?

The Open Calls
Aim: to maintain the service attractiveness. E.g. for service launch or on later stages.
Design sprints based on IDEO initiated by e.g. Capital Region (with a sum of money) defining gates and deadlines to accelerate the processes. Video of spokesperson from Capital Region framing a problem. Provide frameworks, structure and process plans with short deadlines. Process: Clustering of ideas, commenting, voting, choosing.

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Service pain points

- **Open source trust:** How is trust created so the service enable open sharing? The aim should be that users want to share what went wrong as well.

- **Language:** How is a clear case formulated so it is accurately understood across multidisciplinary users? Mario would have another language than Becky and search for other words.

- **Structure of partnerships:** Do the partners invest the same amount of money? Who takes the managing role? How is the timeline coordinated? Are there hospitals that have ekstra barriers to partner up due to competition?

- **Local vs general problems:** Problems and ideas are defined by local conditions. Can other users relate? Will the solutions become too general and therefore not suitable for local conditions?

- **Filtering:** how can the database find and show the most relevant cases for Becky's needs?

- **Filling in the right information:** How do we ensure Astrid provides the right information? She is not schooled in writing briefs.

- **Lack of content flow:** What if no other users comment on the idea or problem? This will create disappointment and perhaps embarrassment. It might even become a barrier of sharing.

The co-design session ideas and reflections ended up defining many of the service elements. Especially the identified pain points were carefully considered and essential when developing the service details via the storyboards, the blueprint and the digital prototype.

The aim is to offer the user maximum support during these pain points. Extra energy were therefore devoted to design these elements with empathy for the users. Elaborate reflections regarding this can be found when the digital prototype is presented.

VALUE PROPOSITION

A value proposition is a process exercise to gather, maintain and evaluate the value the product or service aims to create for the users (Kiertzner A. 2017)

The value proposition should define how the service:
 - Solves problems for the user or improves their situation (relevans)
 - Delivers a specific benefit (quantitative value)
 - Differentiates from competitors (uniqueness)

Value proposition for Hospital Innovation Hub target group:

Improving hospitals worldwide by sharing ideas, frameworks and know-how with peers and experts across the hospital sector.

We need to think together to think big and innovate efficiently.

With the above proposition the service offer is a direct response to the needs identified during the research of the target group.

I tried embedding the value proposition in each service element afterwards however it felt slightly vague to form a high complexity service around a value statement. The tool might be better fitted as a guiding star when more people are involved in the design process, however it ended up being too simple for this context.

STORYBOARDS

Storyboards are a tool to help define the specific aspects of an ideal service experience. They are sketches of different phases of the service experience that allow the designer to play with different types of experiences with the aim to satisfy the client need and fulfill the value proposition. (Kiertzner A. 2017)

Two storyboards were built exploring different phases of the service and how it could offer an optimal service experience for the user, in this case the persona Becky. The selected scenarios include as many contextual details as possible. The aim was that it should be easy for anyone viewing them to quickly grasp the service potential. The storyboards shows two different situations: 1) First time use and 2) Leapfrogging.

The storyboards helped in the design process as it allowed to step in the shoes of a user and define the scenario from their perspective. It opened for reflections about what kind of content Becky would like to find on the platform. What does it actually look like? What are her preferences and needs? The result was to put greater emphasis on the professional aspects as Becky wants to be impressed and inspired by the current content.

See the storyboards on next pages.

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Open Innovation Platform – Leapfrogging

Innovation manager Becky receives a mail from her director...

Dear Becky,

We succeeded in getting the funding DKK 8.00.000 for modernizing the Pediatric section.

Will you submit a prioritized list of potential improvements next week Friday?

Becky logs on to Open Innovation Platform for inspiration...

Pediatric

GO

Top rated   # Pediatric

Add filters   78 in total

cutting cost

patient experience

new technologies

process efficiancy

easy implementation

Becky browses through cases and chooses five to further investigate.

Each case has a format that makes it easy for Becky to understand the values, challenges and details. The comments below the cases are often from piers who add interresting value or reflection.

What a time saver!

Becky eventually prints out four cases and adds her comments on local implementation. She is excited to hand it over to her director.

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BLUEPRINT

It was now time to blueprint the service. A blueprint shows all the elements contained within a service incorporating the perspectives of both the user, the service provider and other relevant actors that may be involved (Stickdorn & Schneider 2011, p. 204-207). This gives a detailed overview of everything from the points of user interaction to behind-the-scenes processes.

At this stage of the service design process the aim of the blueprint is both to get an overview of the different elements in the service and to explo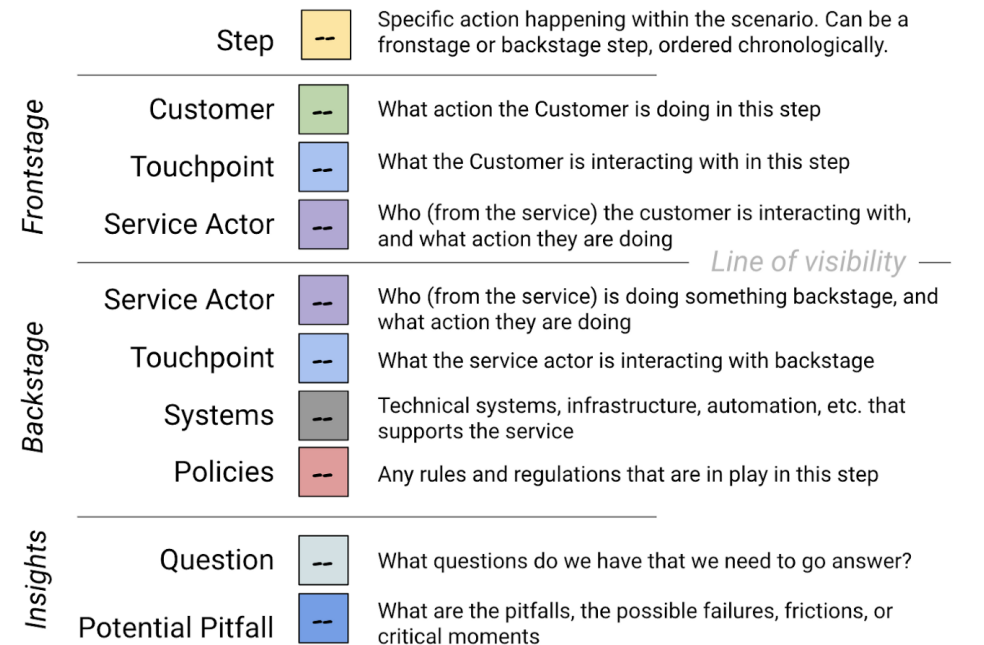re how the processes fit together as a holistic system, as well as identifying elements that should be further reviewed and refined. Also it is time to consider what type of physical evidence each touchpoint of the service experience should ideally be based on. Often once ideas and innovations have been formulated, the blueprint is further detailed and expanded before implementation (Stickdorn & Schneider 2011, p. 205).

There is a difference between current-state blueprinting and future-state blueprinting (practicalservicedesign.com March 15, 2018). In current-state blueprinting you look into an existing service to explore the user experience and how it might be improved. Future-state blueprinting however, is about inventing something new and to explore the feasibility of the service, how an ideal user experience might look like and what is demanded from the service provider to deliver this service. As the hospital innovation platform is a "new invention" the blueprint has been designed using the future-state blueprinting approach.

Co-founder of www.practicalservicedesign.com from Stanford University IT, Megan Erin Miller has proposed the following model for Future-state blueprinting. This has been main source of inspiration for the hospital innovation platform blueprint.

Frontstage

Step	--	Specific action happening within the scenario. Can be a fronstage or backstage step, ordered chronologically.
Customer	--	What action the Customer is doing in this step
Touchpoint	--	What the Customer is interacting with in this step
Service Actor	--	Who (from the service) the customer is interacting with, and what action they are doing

— *Line of visibility* —

Backstage

Service Actor	--	Who (from the service) is doing something backstage, and what action they are doing
Touchpoint	--	What the service actor is interacting with backstage
Systems	--	Technical systems, infrastructure, automation, etc. that supports the service
Policies	--	Any rules and regulations that are in play in this step

Insights

Question	--	What questions do we have that we need to go answer?
Potential Pitfall	--	What are the pitfalls, the possible failures, frictions, or critical moments

Model for Future-state-blueprinting by Megan Erin Miller

Having completed the storyboards beforehand made it easy to define the steps in the user action layer. Subsequently, all the information gathered about the user's needs, behaviour, painpoints and social context provided a great foundation when defining the rest of the layers, both frontstage and backstage processes.

See service blueprint on next page.

SERVICE BLUEPRINT

		AWARE	FIRST TIME USE		DAILY USE				
Frontstage	Touchpoints	- Hospital innovation event - Social media	Website		Website				
	User action	Get to know about service	Enter website & browse it	Set up profile	Browse innovations	Add likes & comments to innovations	Access roadmaps, framework & tools	Add innovations	
	Existing users				Add innovations	Browse innovations		Add likes & comments to innovations	
	Capital Region	Ambassador role: Service presentation							
Backstage	IT Infrastructure			Store new users on ID storage				Generate data statistics on innovations	
	Office	-Provide Service presentation -Instruct ambassadors			Update relevant hashtags			Receives statistics data	
Insights	Questions				How "old" are the innovations allowed to be?			What would be the best use of statistics?	
	Potential Pitfalls				If the innovations are not inspiring/appealing enough		If toolbox is not relevant/professional enough		

STRATEGIC ALLIANCE

OPEN CALL

Line of visibility

	Website		Website			Website		
Update the hospital's roadmap		Present problem & idea for solution	Source strategic partners	Choose partner(s) & customize contract			Show interest & join ideation dialogue	Submit solution proposal
Update the hospital's roadmap			Show interest & start partner dialogue				Show interest & join ideation dialogue	Add likes & comments to proposals
Access to overview on roadmaps						Frame problem & project details		Choose solution & project partners

Line of visibility

- Publish problem for relevant users
- Frame problem & project details (below line)
- Publish problem for relevant users
- Encourage Open Calls

					Should the service support this step?	Who are allowed to add Open Calls? Private/Public?

- If roadmaps are outdated
- If no one shows interest or timing is bad
- If serious problems occur between partners

Especially reflecting on the two bottom layers, the questions and potential pitfalls, was of great value at this point. The reflections create a good overview of what is still crucial to consider and enables a prioritisation of which elements to solve first. At this stage there are still many questions and potential pitfalls so only the most crucial has been added here.

This blueprint is not a final blueprint that should be used for a potential client. It is rather a tool to help identifying elements of the service that can be solved or refined during this iteration. The bottom layers are therefore not included in the product report blueprint.

The biggest eyeopener while making the blueprint was that not many actions are needed from the service provider after the service has been set up. The IT infrastructure actions can be automated and it is the users who generates the content. This is a great selling point towards potential service providers if any persuasion is needed.

REVISITING THE SERVICE NAME
It was now time to discard the working title of the service Open Innovation Platform. The criteria for the name are the following:

The name should...
 - Appeal to the users and stakeholders
 - Signal the main values
 - Be unique: it should not associate to other concepts or services

What also influenced the changed of name was the feedback during the concept validation that the service should avoid being associated with Sundhedsplatformen.

A few suggestions, that were looked into:

The Hospital community
Co-designing Hospitals
Hospital Best practice
Hospital Innovation Hub
Open source Hospital
Hospital Innovation
Hospital Improve
Better Hospital
Share for Hospitals

After a quick brainstorming the choice landed on Hospital Innovation Hub. Hereby the word Platform is left out and does not give negative associations. It replaces it with the word Hub which gives associations to an inclusive creative space.

Hospital Innovation Hub

At a later stage it will be further explored whether the word Innovation is the appropriate choice. It might give the wrong expectation of the service content which should welcome all ideas for improvement, including small incremental innovations. An alternative at this point is Improvement. The service name should have maximum appeal amongst the target group and will therefore be evaluated and refined throughout the design process.

DIGITAL PROTOTYPE

As the Hospital Innovation Hub is mainly a digital service I found it important to build a digital prototype to test and gain knowledge about the user experience. The plan was to build an interactive and high fidelity prototype, that could be used for testing as well as to be presented to stakeholders.

Wireframes

The process of building a digital prototype started with wireframing, which means designing a website service at a structural level. A wireframe is commonly used to lay out content and functionality on a page which takes into account user needs and user journeys (Experienceux, 20 September 2018).

I used the Crazy Eight method, where the designer folds a paper so it has
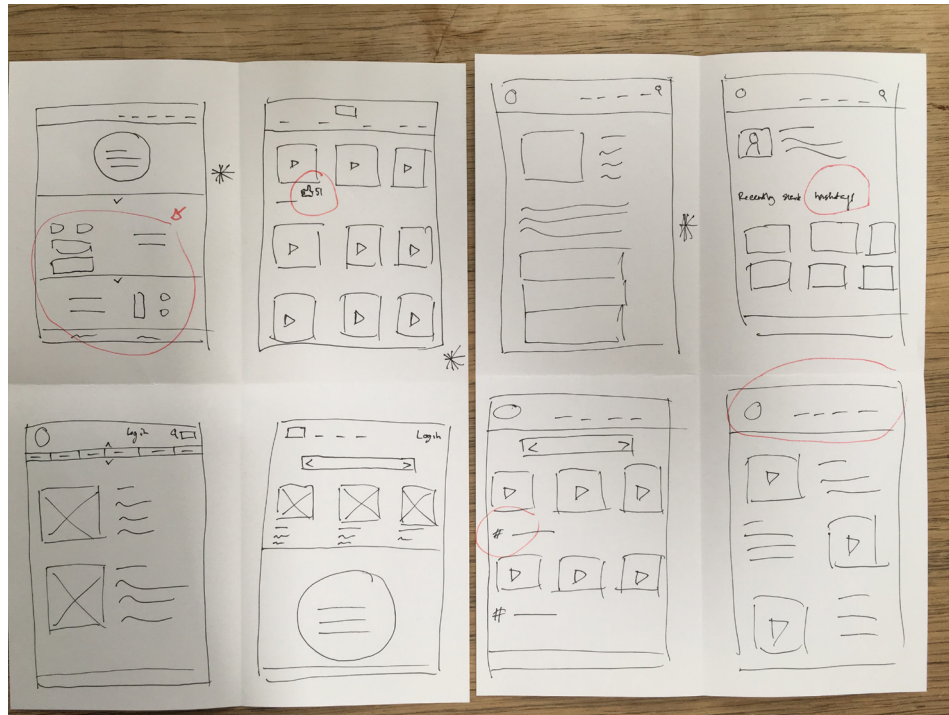
Crazy Eight sketches for wireframing

eight different spaces. After listing the important content elements to include in the wireframe, you sketch eight different models of the website structure testing how different elements could be placed. The purpose is to think out of the box and empty your brain for different creative solutions. Thereafter I marked the good ideas with a red pen and applied them to the UI designs.

Website design

The website screens were designed in Adobe XD as it enabled to simulate the interaction flow. The Prototype feature allows for the designed elements to be linked and eventually converted into an online link where the user can interact with the prototype.

XD link for the interactive Hospital Innovation Hub:
https://xd.adobe.com/view/629820ee-51f7-4851-6b57-ccffda0d09db-14a9/?-fullscreen

A few screenshot of the website designs can be seen on the next pages. It is the final version including refinements from testing sessions in later stage. The complete screenshot material is presented in the Product Report.

Landing page

A platform for co-creating hospital improvements by sharing ideas, frameworks and know-how

Join the co-creation of the future hospitals
Connect with hospital professionals to ideate, design and deliver better solutions, faster. Get quick answers to your questions and have productive, spontaneous conversations with peers and experts across the hospital sector.

Empathize   Define   Ideate   Prototype   Test

Customizable toolbox for hospital innovation
Get access to the best frameworks & tools designed specifically for hospital innovation

About

Vision for Hospital Innovation Hub

It takes a collaborative approach to solve the complex health challenges of the future. Hospital Innovation Hub offers a platform for hospital staff to improve the hospital practice via co-creation. Hospitals hold a great variety of specialized knowledge that should be the foundation of the innovative solutions that will define our future healthcare system.

We invite you to join the co-creation and share your ideas, experience and input to further improve the hospital practice.

Statistics

Ideas:	432
Users:	611
Comments:	2185
Strategic partnerships:	49

Project partners

Nordic Innovation   MINISTRY OF HEALTH   AALBORG UNIVERSITY HOSPITAL   The Capital Region of Denmark   Healthcare DENMARK

Contact   About Hospital Innovation Hub   Funded by

50

Framework & tools

Hospital Innovation Hub

About | Ideas | **Framework & tools** | Log in or sign up

Methods and tools developed for hospital innovation

Empathize | Define | Ideate | Prototype | Test

Templates

- Roadmaps
- Project planning
- Documents for securing internal support
- Contracts

Contact | About Hospital Innovation Hub | Funded by

Profile view

Hospital Innovation Hub

Ideas | Roadmaps | Open Calls | Framework & tools | **Becky**

Log out

Becky Magnussen
Innovation Manager at Bornholm Hospital

Experience…

Ideas added:	12	Ideas commented:	87
Ideas liked:	123	Followers:	62

Contact | About Hospital Innovation Hub | Funded by

Ideas (after log in)

Hospital Innovation Hub

Ideas | Roadmaps | Open Calls | Framework & tools | Becky

Open Call

Newest ideas

Natural light lamps 14 48
Natural light lamps that follows the sun spectre proves to increase patient mood.
Added by Anders Sode West on 31.08.2018

Chemo at home 8 87
Patients receive chemo treatment in their home via a portable bag
Added by Katrine Fridthjof on 07.11.2017

XXX 23 56
XXX
Added by xxx on 31.08.2018

Browse ideas
Share idea

Search ideas

Search ideas… | most liked | 15

Chemo at home 8 87
Innovation stage: Diffusing
Rigshospitalet offers patients to receive chemo treatment in their homes via a portable bag instead of the normal hospital admissions.
Added by Katrine Fridthjof on 07.11.2017
#Chemo-treatment
Join discussion

XXX 23 56
Innovation stage: Ideating
XXX
Added by XXX on xxx
#xxx
Join discussion

Natural light lamps 14 48
Innovation stage: Implementing
Natural light lamps that follows the sun spectre proves to increase patient mood in Rigshospitalet Glostrup.
Added by Anders Sode West on 31.08.2018
#patient-care
Join discussion

My activity

- [ ] Following
- [ ] Not viewed
- [ ] Viewed
- [ ] Commented on
- [ ] Liked

Categories

- [x] All Categories
- [ ] Cutting cost
- [ ] Patient experience
- [ ] New technologies
- [ ] Process efficiency
- [ ] Plug & Play

Search hashtags…

#VR #chemo-treatment
#front-loading #wayfinding
#self-care #waiting-room
more…

Contact | About Hospital Innovation Hub | Funded by

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Share idea

Hospital Innovation Hub

Ideas   Roadmaps   Open Calls   Framework & tools   Becky

Browse ideas

Share idea

Headline

Innovation stage (Problem, Ideating, Developing, Implementing, Diffusing)

Upload 90 sec video presenting the idea

Short Description

Value for patients   Core Learnings   Cost savings

Value for staff   Core issues   Time savings

Collaborators   Suppliers   Contact info

Add hashtags...   Share

Contact   About Hospital Innovation Hub   Funded by

Roadmaps

Hospital Innovation Hub

Ideas   Roadmaps   Open Calls   Framework & tools   Becky

Bornholm Hospital
Managed by you

Projects to complete   Projects to explore

Add project(s)   2021   Add project(s)

Add project(s)   2020   Add project(s)

2019

Add project(s)   Add project(s)

Add project(s)   2018   Add project(s)

Hospitals in your Region   see more...

Rigshospitalet   Nordsjællands Hospital   Herlev Hospital

Hospitals in your country   see more...

Aalborg Hospital   Horsens Hospital   Odense Hospital
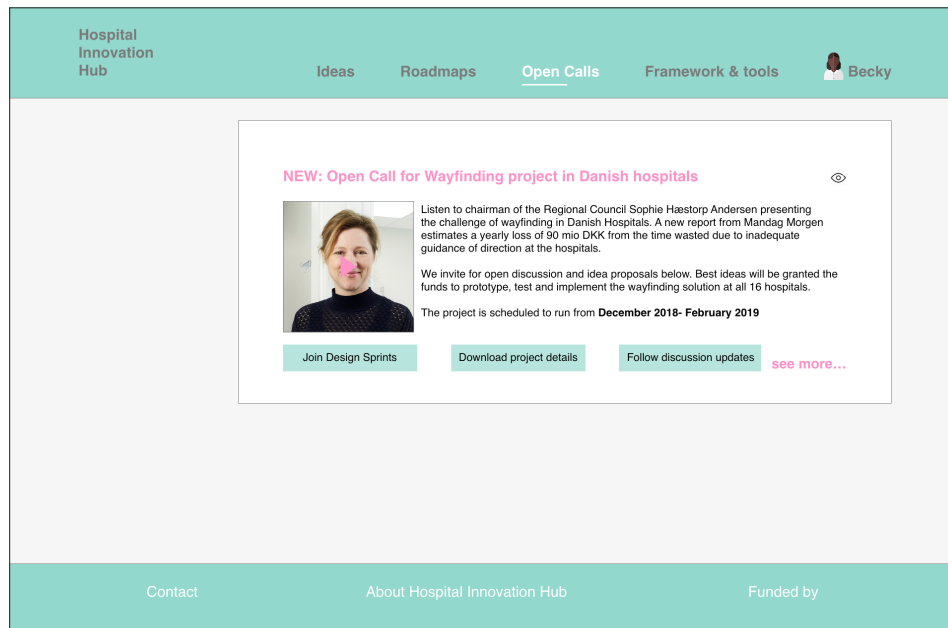
Hospitals in Europe   see more...

St. Mary's Hospital   Utrecht Hospital   University Hospitals Pitié

Contact   About Hospital Innovation Hub   Funded by

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Open calls

The process of building the website designs initiated many important considerations and improvements of the service.

The innovations had until now been defined as innovations. However, first pre-testing of the website design questioned why user discussions are not better facilitated. The innovations seem like a sharing of successes instead of what is intended with the service: sharing ideas, co-creating and learning from each other. This made me reflect further on the word innovation. It seems much more mature in its development than e.g. ideas. The aim is to encourage users to share ideas of all maturity stages and further improve them via dialogue amongst the users. Therefore I made the decision to rename the innovation to ideas and add a function for the users to categorise the innovation stage of maturity. The innovation stages are a hybrid between Nesta's innovation stages (see page 12) and the Design Thinking stages as the

overall mindset within the proposed methods and frameworks are based on Design Thinking.

As a result the innovation stages in Hospital Innovation Hub range from Problem, Ideating, Developing, Implementing, Diffusing.

This should increase the incentive to share early stage ideas and even ideas that have failed to work as intended. Sharing a failure might initiate a discussion leading to alternative solutions for the current problem. This scenario will be discussed further later in the thesis.

The design process also initiated other decisions.The wording of the vision, what kind of activity to show on each profile view, what categories to filter the ideas in etc. All essential elements defining the service concept.

SERVICE TESTING

The digital prototype was tested during two sessions. The aim was to explore if the service prototype appeals to the needs that were identified amongst the potential users. What are the responses and general feedback? Is it something they could imagine using themselves? What are the most valued features? Are there any excess features that should be reconsidered? Which refinements should be prioritized at this point? Etc.

The first testing session was with innovation manager at Rigshospitalet Peter Aagaard Nielsen, who already contributed with insights in the discover phase. The other session was at VihTek (described in chapter Hospital Innovation in Denmark) at Glostrup Hospital. The participants were service designer and project manager Camilla Cramer and information specialist Sune Mølgård Faber. Camilla's knowledge bridges the two main themes for this report, healthcare innovation and service design. Sune is in charge of communicating VihTek's initiatives to their stakeholders. In addition he identifies existing innovative solutions, which he presents to the different departments with the aim for them to buy in and implement. Both jobs include processes where

Hospital Innovation Hub could be a great helping tool, so I was excited to hear their comments on the service concept.

The duration of the testing sessions were 75 and 120 min. To avoid influencing the participants with my research results, the prototype was introduced early in the sessions. I gave a tour in the digital prototype explaining the different functionalities. The tour was followed by general questions that opened up for more detailed discussions. I brought along the personas for the testing sessions as well to get the participants to reflect on whether the service would cover needs from the other user groups.

SERVICE TESTING RESULTS

In general, the participants shared positive feedback and attitudes towards the service concept. They could all imagine themselves using it, however their approach and preferences differed.

Peter highlighted the increased awareness of ideas and acceleration of processes as the main incentives for him to use Hospital Innovation Hub. He also highlighted the marketing potential and saw it as a great channel to spread the ideas, problems and solutions they have been working on in his hospital. A third benefit that Peter highlighted was the opportunity to source help from people with the right knowledge. As an innovation director Peter spends much time on this challenge and it often happens randomly based on his direct network. When realising that Hospital Innovation Hub could help connect him to users within specific areas his reaction was: *"This thing is brilliant."* The last feature that Peter highlighted was the opportunity for users to bypass good ideas and develop them, despite lack of support and resources locally. From his experience, even great ideas can easily get stuck in the department as the initiators are not supported by their direct managers. Hospital Innovation Hub offers a way to channel the ideas to peers in other locations with relatable ideas or problems who can help maturing it and analysing the potential.

Camilla at VihTek mentioned the hospital roadmaps as the most valuable function for her. She had experienced that other hospitals had been looking into ideas parallel with VihTek and it could have saved both parties lots of time and effort if they had coordinated their projects. This overview of what the other hospitals plan to implement and further explore will enable increased collaboration and coordination across the hospital innovation sector.

Sune mentioned the overview of ideas as the most valuable feature for him: *"It would be great if you could easily search within a specific area and find all the ideas and innovations there. Especially if there are plug and play solutions"*.

All three participants would definitely share ideas, comment and be active if

the service was launched. When asking Peter whether he would share information about ideas that failed or did not go as hoped, he answered yes with no hesitation. *"Learnings are way more important than image"*. When asking Camilla and Peter the same question they were also open to share failures and mentioned several cases where they had been open about this to collaborators. The clinicians however, have a different kind of protective attitude towards their ideas. From Camilla and Sune's experience they keep their ideas to themselves until they are fully researched and developed. Some of the projects VihTek are engaged in are simply awaiting research papers from researchers and the waiting time here can be very long. The research community within health generally maintains a non sharing culture.

Both participants from Vihtek questioned if hospital staff outside the innovation and development department would use the service at all. They would have to be guided to it, as they from their experience will not by themselves go home and use it if it has only been mentioned to them. It needs to be incorporated in their work. This initiated an important discussion that Peter also started about the organisational changes needed when implementing Hospital Innovation Hub. It is important to get support for the service from management level so time and resources are allocated internally to spend on using the service. It is vital to build an incentive structure that allows for the hospital professionals to invest time in the service. Management at each hospital needs to identify a representative who is in charge of updating the roadmap for that hospital and ensure that ideas are uploaded.

Despite the challenges to get healthcare professionals engaged as active users they all saw a big potential for innovation units and actors who are already involved in hospital innovation. They confirmed the need for increased transparency and collaboration across the sector.

In Peters opinion, no elements in the digital prototype are superfluous. In Camilla's opinion, the access to hospital innovation frameworks and tools is pointless. From her experience, people have no benefit of having the tools if they do not get good training in using them. This is a really great point.

Framework and tools cannot just be used by individuals with no prior knowledge about hospital innovation processes and procedures. However, it could still be of value for innovation and development units across the hospital sector to harmonise and refine their approaches and Camilla agreed with me on this point. In her role as a service designer it is a constant struggle to convince her colleagues and collaborators within the innovation departments of the value of design thinking. To the contrary, she is asked to attend courses to learn methods and approaches to innovation with no understanding of user needs, agility and fast prototyping.

As a last take away from the prototype testing it is worth mentioning Peter's advice to filter the personas and only target the easier groups, i.e. innovation departments inside the hospitals and individuals who are already often used in innovation processes. "My experience is that some are very eager to participate". These groups will give plenty valuable input and activity to begin with. Peter's hypothesis is that many other types of users might follow if Hospital Innovation Hub shows to become a success. Clinicians are often very bound to their research traditions anyway which limits them in thinking creatively. However, to fully achieve the potential of the service concept it is important to get them onboard eventually.

PLAN FOR IMPLEMENTATION

Preparation is needed before the Hospital Innovation Hub can be launched. The plan below is a list of actions to initiate prior to service implementation. The action points should not be initiated chronologically but parallel and in an agile project approach. The ambition should be to further involve and co-create the service with key stakeholders in the hospital innovation ecosystem.

A trial period within one or two regions is recommended to ensure final refinements before launching nationally and thereby involving all hospitals in Denmark.

1. Funding and ownership from public or private institution(s), preferably from trusted actors and with full transparency on who funds what.*

2. Involve Danske Regioner and all hospital directors to secure support and ownership. Commitment includes appointing local representatives who are responsible for the hospital's service engagement.

3. User research and involvement has been concentrated on one user group during the service design. Increased involvement with other user groups are needed to achieve a deeper understanding of their drivers and barriers to use the service, plus how they are successfully reached.

4. Engage a design thinking agency, preferably specialized in healthcare innovation to design the hospital Innovation frameworks, tools and templates. This process should involve innovation managers from across the hospital innovation ecosystem.

5. Build application.

6. Explore the opportunity to link Hospital Innovation Hub to existing systems in the hospitals, e.g. Sundhedsplatformen.

7. Plan first Open Call for service kick off in collaboration with suitable actor.

*When asking the potential users of Hospital Innovation Hub suitable candidates include Danish Healthtech, Danske Regioner, Forum for Forskning, Innovation og Regional Udvikling (FIRU), Center for Offentlig Innovation, Innovationsfonden and Nordic Innovation.

FINAL REFLECTIONS

The theme
Hospital innovation is a complex arena to enter. Every week during the process of developing the service I found new information and initiatives that complicated the picture even more. The transformation has started but has a long way to go to catch up with commercial players in the healthcare industry. Alone the process of mapping the hospital innovation ecosystem in Capital Region turned out to be a big challenge. Continuously, when meeting hospital innovation experts they could mention new actors, however with little knowledge about what they are doing. This confirmed the need for increased transparency and collaboration across the sector.

Based on the feedback from the involved hospital innovation experts it is safe to conclude that a transformation of the hospital sector requires greater support and engagement from hospital management level. This is a requirement for implementing a service like Hospital Innovation Hub. Lobbying for increased priority of hospital innovation is an integrated part of the process when a service designer enters this arena.

Co-creation and user-centeredness
The aim from the beginning of the design process has been to co-create the service concept with future users and other relevant stakeholders, preferably from as early in the process as possible. Identifying the challenges and needs from where the service design is founded, happened via in-depth interviews with informants representing different parts of the hospital innovation ecosystem. The development and design of Hospital Innovation Hub happened subsequently via various co-design exercises, where participants were asked to build on scenarios that were missing key information or design the user journey from step to step. Finally the concept was validated and tested amongst the users, which led to several improvements of the service. On this basis, it can be concluded that the attempt of co-creation was successfully accomplished.

Hospital innovation actors are a busy breed, however. Ideally I would have arranged workshops where they could innovate and co-create in cross-disciplinary groups. This proved to be a bigger challenge than expected. The interest and willingness to get involved was overwhelming, but due to busy schedules, it ended up being an accomplishment alone to fit in a one-on-one meeting.

Imbalance in user group participation
Throughout the development and testing phase there's been a more concentrated involvement of one user group compared to the others; the innovation managers/facilitators. The final service is therefore stronger in its targeting towards this group. It is possibly the most important group to get onboard initially, but without the clinicians' and caretakers' know-how the content might be too narrowly focused on innovation.

To tackle this potential challenge, the innovation managers/facilitators could function as ambassadors and recruiters for the service. As concluded in the thesis the other user groups' incentives to get on board is naturally smaller and they might need some persuasion or direct contact from the innovation managers/facilitators. Depending on the ideas shared on Hospital Innovation Hub, the innovation managers/facilitators could recruit suitable individuals from their direct network representing the other user groups to join the co-creation. These individuals would then become users and will potentially engage in other discussions on the platform. As Hospital Innovation manager at Rigshospitalet Peter Aagaard Nielsen stated *"My experience is that some are very eager to participate"*. Those are the ones that should be targeted initially and they will in Peter's opinion provide sufficient value for the service to run.

Despite the informants openness to share both successes and failures there might be groups who are more hesitant to share. Being a fully transparent media also means that content can travel to all users and potentially reach funding partners of projects etc. There might be some hesitation to share all details with these groups. It should be further explored whether some ideas should be classified as secret for the invited users only or other alternative

solutions.

Where are the patients in Hospital Innovation Hub?
The decision to not include patients as part of the users of Hospital Innovation Hub is multi-faceted. Within open innovation the aim is to include all relevant stakeholders and one might assume that the patients are the most important group to involve as they are the end users in the hospital ecosystem. It is important to state that the ambition with Hospital Innovation Hub is to set the stage for involving the patients as a vital part of the innovation development. They are just not included as users in the service. The intended users have direct contact to the patients and can observe, detect and evaluate the potential problems and opportunities. Hospital practice relies on vastly complicated procedures and systems that the patients cannot include in their assessment. From the insights gathered during this thesis it can be concluded that it would become a barrier for the other users if patients were active there as well. The opportunity to connect with peers and learn from each other is essentially the value the service offers.

Regional differences in innovation priority in Denmark
During the design process the scope was limited to focus on Capital Region. It was remarkable to learn that despite the regions high ambitions for innovation the informants problematised that it feels less prioritised here compared to other regions. This can also be seen in some of the innovation initiatives coming from the other regions recently. Central Denmark Region (Region MidtJylland) announced the launch of HealthD360, an integrated personalised health platform collecting data from personal devices, Danish registers, the healthcare system etc. (Mandag Morgen 23. September 2018) This data will - hopefully with maximum security - be organised and used for personalised treatment and prevention of diseases, increased coherence between healthcare entities, new research possibilities, knowledge and innovation. The North Denmark Region (Region Nordjylland) started the Idea Clinic (Ideklinikken) at Aalborg Hospital already in 2013 and they have 12+ full time employees (ideklinikken.rn.dk). They collect ideas for healthcare improvement, develop and test them and collaborate with a broad range of the

stakeholders in the healthcare ecosystem. Their director Kjeld Lisby received international attention when he announced that the investment in innovation has resulted in financial gain: *"In many organisations innovation and development is seen as a cost, however we can today document that we both create an economic gain while also increasing the patient's quality of life and the well-being of our employees"* (theinnovationboard.com). The higher priority of innovation in other regions could implicate that Hospital Innovation Hub is easier to introduce and implement in these regions.

Other initiatives
While developing the service presented in this thesis a similar service has launched called Made4you: Careables. The difference is that it mainly targets citizens and enable them *"to co-design and deliver people-oriented health products through means of digital fabrication"*. (https://www.careables.org). The activity is very limited, maybe due to the recent launch. It demonstrates the helthcare industry's openness to co-creation however, and it will be interesting to follow.

Initial reception
The service concept has been very positively received amongst potential future users of Hospital Innovation Hub. The interest increased towards the end of the process where the service could be presented via the prototype that were refined during several iterations. The involved hospital innovation experts recognised the potential and benefits of the service. More than one of the involved hospitals showed clear interest in partnering up with the aim of becoming a test arena for the service. This opportunity will be explored further in the near future.

REFERENCES

Accenture (2017). *Healthcare Innovation. **Clear vision, hazy execution.*** Report retrieved on 28 February 2018 on https://www.accenture.com/t20180201T111446Z__w__/us-en/_acnmedia/PDF-38/Accenture-Healthcare-Innovation.pdf

Albury, D. et. al. (2017). *Against the Odds: Successfully scaling innovation in the NHS*. Innovation Unit and The Health Foundation.

Bhatti. Y, Castillo. J, Olson. K & Darzi. A. (2018). *Putting Humans at the Center of Health Care Innovation*, Harvard Business Review March 2018. Retrieved 5 April, 2018 on https://hbr.org/2018/03/putting-humans-at-the-center-of-health-care-innovation

British Design Council, (2005). *The Design Process: The 'Double Diamond' Design Process Model.* Retrieved April 17, 2018, from http://www.designcouncil.org.uk/ sites/default/files/asset/document/ElevenLessons_ Design_Council%20(2).pdf

Bush & Fox (2016). *Bringing the Power of Platforms to Health Care.* Harvard Business Review. Retrieved 28 April, 2018 on https://hbr.org/2016/11/bringing-the-power-of-platforms-to-health-care

Cottam & Leadbeater, (2004). *Red Paper 01. Health: Co-creating services.* Design Council. United Kingdom

Danish Design Centre, 1 September 2016. *Danmarks designere kan redde sundhedssektoren.* Retrieved February 4, 2018 on https://danskdesigncenter.dk/da/danmarks-designere-kan-redde-sundhedssektoren

Danskdesigncenter.dk: *Om Design Sundhed*. Retrieved March 14, 2018 on https://danskdesigncenter.dk/da/design-sundhed

Ehn, Pelle (2008). P*articipation in design things*. Proceedings of Participatory Design Conference (PDC), Bloomington, Indiana, USA, 2008.

Experienceux 20 September 2018: *What is wireframing?* Retrieved 25 August on https://www.experienceux.co.uk/faqs/what-is-wireframing/

Freire & Sangiorgi (2010). *Service design & healthcare innovation: from consumption to co-production and co-creation.* Paper presented at Nordic Service Design Conference, Linkoping, Sweden.

Gabriel. M., Stanley. I, Saunders. T (2017). *Open innovation in health: A guide to transforming healthcare through collaboration.* Nesta publication, May 2017. Retrieved 6 February 2018 on https://media.nesta.org.uk/documents/open_innovation_in_health_0.pdf

Godtsygehusbyggeri.dk: *Region Hovedstaden.* Retrieved 1 September 2018 on http://godtsygehusbyggeri.dk/maal-og-styring/kort-fortalt-om-sygehusbyggerierne/regionsfakta/region-hovedstaden

Hertog et al. (2005). *Mapping healthcare innovation: tracing walls and ceilings.'* Maastricht NL: UNU-MERIT.

Hospitalsplan 2020: Region Hovedstadens innovationspolitik 2020: Nyt, nyttigt, nyttiggjort. Region Hovedstaden, January 2013, 1st edition.

Ideklinikken.rn.dk: *Om Ideklinikken* Retrieved 24 September 2018 on http://ideklinikken.rn.dk/om-ideklinikken

IDEOU.com *Why Design Thinking.* Retrieved 1 September 2018 on https://www.ideou.com/pages/design-thinking

Jeroen Tas, 2017: *What the platform economy means for healthcare* Retrieved 8 August on

https://www.weforum.org/agenda/2017/07/platform-economy-healthcare/

Jørgensen U., Lindegaard. H., & Rosenqvist, T. (2011) *Engaging actors in co-designing heterogeneous innovations.* International Conference on Engineering Design, ICED11, Technical University of Denmark.

Kiertzner A. (2017). *Value Proposition*. Director of Research & Insights at Attention, Retrieved 19 April 2018 on https://danskdesigncenter.dk/da/vaerktoej-value-proposition

Kvale S. (1996). *Interviews An Introduction to Qualitative Research Interviewing*, Sage.

Lindegaard & Kawasaki (2010). *The Open Innovation Revolution: Essentials, Roadblocks, and Leadership Skills*, John Wiley & Sons Inc.

Mandag Morgen 19 may 2018: Hospitalerne skal genopfinde sig selv. Retrieved 20 May 2018 on https://www.mm.dk/artikel/hospitalerne-skal-genop-finde-sig-selv?ref=newsletter&refid=140&SNSubscribed=true&utm_source=nyhedsbrev&utm_medium=e-mail&utm_campaign=

Mandag Morgen 23 September 2018: *Dansk platform skal demokratisere brugen af sundhedsdata*. Retrieved 24 September 2018 on https://www.mm.dk/artikel/dansk-platform-skal-demokratisere-brugen-af-sundhedsdata.

Medium.com, (2017): *Why do you need a Kanban board?* by Product Manager Thaisa Fernandes. Published 25 August 2017. Retrieved 14 April, 2018 on: https://medium.com/project-management-learnings/why-do-you-need-a-kanban-board-63db13c685f8

Mckinsey.com, August 2018: *From product to customer experience: The new way to launch in pharma.* Retrieved 24 August 2018 on https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/from-product-to-customer-experience-the-new-way-to-launch-in-pharma?cid=soc-app

Ministry of Health (2017). *Healthcare in Denmark, an overview.* Published by Ministry of Health. Version: 1.2. Retrieved 14 March, 2018 on https://www.sum.dk/English/~/media/Filer%20-%20Publikationer_i_pdf/2016/Healthcare-in-dk-16-dec/Healthcare-english-V16-dec.ashx

Moritz, S. (2005). *Service Design: Practical access to an evolving field* (M.A. Thesis: Köln International School of Design). Retrieved 5 September, 2018 on http://hci.liacs.nl/files/PracticalAccess2ServiceDesign.pdf

Naida, G. & Hagood, C (2012). *Lean-led hospital Design: Creating the efficient Hospital of the future.* CRC Press. Taylor & Francis Group. New York

Oxford dictionary definition: Retrieved 8 August 2018 on https://en.oxford-dictionaries.com/definition/platform

platformdesigntoolkit.com: *Platform Design Toolkit.* Retrieved on 16 April 2018 on: https://platformdesigntoolkit.com/wp-content/docs/Platform-Design-Toolkit-Whitepaper-ENG.pdf.

practicalservicedesign.com March 15, 2018: *The difference between current state and future state blueprinting.* Retrieved 8 August on https://blog.practicalservicedesign.com/the-difference-between-current-state-and-future-state-service-blueprinting-145adeb44245

Quartz 30 January 2018: *In just two hours, Amazon erased $30 billion in market value for healthcare's biggest companies.* Retrieved 2 February 2018 on https://qz.com/1192731/amazons-push-into-healthcare-just-cost-the-industry-30-billion-in-market-cap/

Regioner.dk: *Kliniske forsøg - medico.* Retrieved 28 September 2018 on https://www.regioner.dk/sundhed/forskning-og-innovation/kliniske-for-

soeg-medico

Regionh.dk 1: *Welcome to New North Zealand Hospital.* Retrieved 18 February 2018 on
https://www.regionh.dk/nythospitalnordsjaelland/english/Sider/New%20North%20Zealand%20Hospital.aspx

Sanders & Stappers, (2008). *Co-creation and the new landscapes of design. CoDesign Journal.* International Journal of CoCreation in Design and the Arts. Volume 4, 2008 - Issue 1: Design Participation

St. Andrews Lean consulting. *Kipling Checklist.* Retrieved 8 August 2018 on http://standrewslean.com/lean-resources/games-tools/kipling-checklist/

Stickdorn M. & Schneider J. (2011). *This Is Service Design Thinking*. John Wiley & Sons Inc.

Sum.dk : *Healthcare in Denmark*. Retrieved 18 February 2018 on https://www.sum.dk/English/~/media/Filer%20-%20Publikationer_i_pdf/2016/Health-care-in-dk-16-dec/Healthcare-english-V16-dec.ashx

Theinnovationboard.com: *Idéklinikken dokumenterer sin return-on-innovation.* Retrieved 24 September 2018 on
https://theinnovationboard.com/aalborg-universitetshospital-maaler-inno-vationseffekter/

Udviklingshospital Bornholm, 2016: *Projektgrundlag.* Retrieved 8 August 2018 on https://www.bornholmshospital.dk/udviklingshospital-bornholm/Docu-ments/Udviklingshospital%20Bornholm%20Projektgrundlag%20160825%20samlet.pdf

Vidensbrokernetværket: *Afrapportering, 2015.* Region Hovedstaden. Retrieved 18 February 2018 on https://www.regionh.dk/til-fagfolk/forskning-og-innova-tion/innovation/Om%20innovativ%20udvikling%20i%20Region%20Hoved-staden/Documents/Afrapportering%20-%20vidensbrokernetværk.pdf

Wired 13 September 2018: *THE NEW ECG APPLE WATCH COULD DO MORE HARM THAN GOOD.* Retrieved 18 August 2018 on https://www.wired.com/story/ecg-apple-watch/

HOSPITAL INNOVATION HUB
A PLATFORM FOR CO-CREATING HOSPITAL IMPROVEMENTS

Rigshospitalet

Nordsjællands Hospital

Herlev / Gentofte Hospital

Bornholms Hospital

Amager / Hvidovre Hospital

Bisbebjerg / Frederiksberg Hospital

TANIA WILLESEN - MASTER'S THESIS - SERVICE SYSTEMS DESIGN - PRODUCT REPORT - 2018

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INTRODUCTION

Hospital Innovation Hub is a supporting service for hospital staff enabling ideas for improvement to be shared, ripened and developed collaboratively. It enables cross-disciplinary co-creation of our future hospital practice, hereby reducing time and effort and simply achieving smarter solutions.

With the increase of populations, lifestyle diseases and people getting older there is a huge need to rethink how our hospitals can run most efficiently. According to Henrik Schødts, project director of hospital Nordsjælland, hospitals today basically operate same way as they did 100 years ago (Mandag Morgen, 19 May 2018).

Innovation ideas emerging inside the hospitals amongst the healthcare professionals who have direct contact to the patients are often linked to larger impact and easier implementation than when the ideas emerges outside the hospital facilities. Barriers including lack of time, strong traditions, routines and hierarchy often stands in the way of getting the ideas developed and implemented at the hospitals.

Numerous innovation networks exist outside the hospitals enabling interdisciplinary cooperation. However, there is no transparency of current or future innovation projects inside the hospitals. Departments within hospitals deal with similar challenges and opportunities for improvement, thus they will benefit from each others ideas, research, perspectives and collaboration. Hospital Innovation Hub offers a transparent space for ideas and problems in all stages of innovation maturity to be discussed, liked and further developed amongst peers and experts in the hospital sector. The users can browse and filter the ideas for inspiration, they can leapfrog on each others' succesful ideas and they can get access to frameworks and tools designed to ensure an efficient hospital innovation process.

A service design approach including in-depth user research and co-creation has been carried out to ensure Hospital Innovation Hub is based on real needs amongst the target group as well as it is designed to fit into their current context and routines.

Hospital Innovation Hub is based on the principles and methodology of design thinking. This approach to innovation offers tools and processes for fast and efficient prototyping and testing. It stands in great contrast to dominating models of innovationin in health that are known to be slow, expensive, poorly targeted and poorly adopted and diffused (NESTA, 2017)

The service has been tested and refined amongst hospital innovation actors in Capital Region with promising results and interest amongst the participants. An implementation of the service is supported by more than one hospital in the Capital Region who volunteer to be test arenas for implementation.

Research has been limited to somatic hospitals in Capital Region to ensure in-depth insights as a service foundation. However, it is the ambition to upscale Hospital Innovation Hub for national implementation, thereby enabling users to co-create across all hospitals in Denmark. The service concept contain a potential to scale it even further to include Scandinavian or European hospitals. This however, require extended research on user behaviour and conditions within these countries.

WHY

TACKLING REAL NEEDS

The foundation of the service is human-centered research into the conditions of actors inside the hospitals who are involved in innovating the hospital practice. Who are they and what are their procedures, context and conditions? What are their current needs, challenges and pain-points? The following quotes have been gathered during the research for the service and outline the main challenges that Hospital Innovation Hub aims to tackle.

"All development of the different departments inside the hospital are decentralized and you do what you feel for at each department at Rigshospitalet."
Peter Aagaard Nielsen, Innovation and Organisational Development Manager at Rigshospitalet

"Innovation in hospitals are often a result of a leading doctor who attends a conference and buys a few products with the assumption that it can cover some needs that he or she has experienced in practice. We have seen that there have been large investments in equipment that is never being used as they have not been implemented. We need to be better in prioritizing what we bring into our hospitals."
Thit Fredens, consultant at Welfare Innovation

"You need to supply a framework and structure, then I'm certain the great ideas will follow from practice. They will not just arise without facilitation, though."
Anne Danielsen, project manager at Design Health at Danish Design Centre

"We are all focused on the same medical speciality and therefore we only think about what could work better at our department. It never happens that someone consider to use the ideas for other departments."
Nana Levann, Nurse in breast surgery department, Herlev Hospital

"Hospitals are simply a bigger driver of innovation than they are allowed today. They contain a large operational machinery which is so specialized and with a broad selection of professional competencies. The wealth of ideas is there and it is also much cheaper if the hospitals start prototyping themselves."
Rune Holdt, Innovation & Technology manager at Nyt Hospital Nordsjælland

"There is not a culture of looking to other hospitals and saying 'those are really great, maybe we can get inspired'. But for the patients, it would be very great to strive towards recognizable solutions."
Thit Fredens, consultant at Welfare Innovation

"The way you organize your department is based on traditions you inherit from your predecessor and then you might add one or two adjustments. This might have been sufficient when we had those small provincial hospitals. Now the hospitals are much larger and we know much more. Still no one looks at them with a production, logistics or service management perspective".
Peter Aagaard Nielsen, Innovation and Organisational Development Manager at Rigshospitalet

"It is not so difficult for the ideas to travel internally in a hospital, it is more difficult to source them from outside. However, that is also because there are no communities where you share those things. Obviously there are some professional communities focusing on specialties, however it would be beneficial to combine various specialties and disciplines."
Thit Fredens, consultant at Welfare Innovation

"Innovation facilitators in the health industry generally lack competencies, such as key design toolsets and methods. The service should supply them with better frameworks for innovating."
Rune Holdt, Innovation & Technology manager at Nyt Hospital Nordsjælland

RESEARCH HIGHLIGHTS

1. Hospitals and their departments innovate autonomously and are a product of traditions and habits plus the composition of employees.

2. There is very little openness and collaboration about innovation between hospitals in Denmark.

3. There is limited organizational structure or support for innovation in Danish hospitals.

4. Best innovation ideas derive from inside the hospitals. They are based on actual needs and easy to implement.

5. Inside the hospital innovation is initiated and carried out by enthusiastic employees driven by intrinsic motivation.

SERVICE BENEFITS

FOR USERS

Qualification of ideas by co-creation and direct feedback

Overview of ideas: opportunity to filter, cluster and compare ideas within specified search criteria.

Awareness and inspiration: Getting inspiration by seeing solutions from similar environments

Leapfrogging: Reuse ideas and experience from other users. Both as full plug and play concepts or just elements.

Shared resources: Doubling brainpower, funds and networks triples the outcome.

Increased interest from potential collaborators and suppliers. If the project is scaled up the interest will follow.

Receive recognition for ideas and input

Enable good ideas to bypass and develop despite lack of support and resources locally.

Get access to frameworks, methods and tools customised for hospital innovation.

Acceleration of hospital improvement processes

Smarter use of funds

FOR HEALTHCARE INNOVATION ECOSYSTEM

Connecting actors for improved innovation results: Combining various specialities and disciplines create stronger solutions

Overview of ideas: opportunity to filter, cluster and compare ideas within specified search criteria.

Greater diffusion: Ideas get broader attention and spread faster

Large scale benefits

Best practice development

Harmonisation and standardisation of innovation processes

Acceleration of hospital improvement

Smarter use of funds from all actors

Detailed insights and data about hospital innovation trends and opportunities

FOR SOCIETY

Developing a collaborative culture

Smarter use of healthcare budget

Highlighting Denmark as innovative healthcare hub

Creating growth potential across healthcare industry

Increased coherence in healthcare system

WHO

TARGET GROUP

The research gathered for the service design process stated a large need to support the innovation ideas that derive from inside hospitals. Therefore, the service target hospital staff/personnel. They have daily contact with the patients, the physical environment and processes inside the hospital. In other words, this group hold key insights about the system the solutions are designed to fit into and therefore are better equipped to detect and evaluate the innovation potentials.

"If we [hospital staff] go and define the problems and what we need, we are sure to get a real need covered. When innovators from outside approach us they don't offer things that we don't need but it is designed by someone who are not aware of the internal processes. They approach with a prototype where the fundamental elements are difficult to adjust."

Peter Aagaard Nielsen, Innovation and Organisational Development Manager at Rigshospitalet

DEFINING THE TARGET GROUP
The target group is defined as hospital staff who are initiating, managing or participating in an innovation process. This also includes e.g. clinicians and nurses who are invited to give their input in a design process, even though they have no prior experience with or knowledge about innovation. Basically it can be any hospital employee with knowledge that could contribute to creating or improving hospital practice, e.g. a nurse, receptionist, surgeon, porter etc.

The user research gathered for the design process showed that the potential users have increased trust in the concept if it is limited to users that they can relate to and whom they share interests and intentions with, rather than including actors like e.g. pharma/tech companies with commercial intentions. The service therefore becomes a channel for peers and experts to connect and openly share ideas without the noise of patient complains or
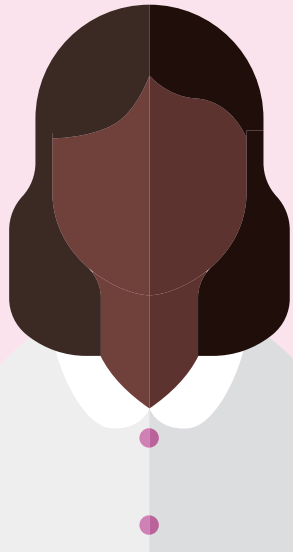
The selected group of users have a common language/frame of reference which can be used for the service, hereby decreasing misunderstandings across the users.

PERSONAS

The four personas have played an essential role when designing Hospital Innovation Hub. They represent four potential users with different occupations, ages and perceptions of innovation. The four personas were designed on early stage based on in-depth interviews and desktop research and has been modified throughout the design process based on new insights or feedback from stakeholders within the hospital innovation ecosystem.

The personas have been used to explore the motivations and barriers towards the service and ensure that the Hospital Innovation Hub appeals to all four types of users. The personas have been integrated into all design decisions throughout the design journey.

Becky Magnussen
Age: 37
Innovation Manager at Bornholm Hospital

What is innovation?
"Innovation is key to meet the health demands of tomorrow. With new technologies and service design we can increase quality and efficiency in the Danish hospitals. The aim is to improve the patient experience as well as the working environment for all hospital employees."

Innovation drivers
 - Innovation mindset, methods and skills
 - Improved patient experience
 - Cost efficiency
 - Process efficiency

Innovation barriers
 - Limited resources. Many ideas battle for her attention
 - Sourcing and prioritizing ideas
 - So structure for scaling successful innovation
 - Bureaucracy and limited structural support from organization

Mario Rose
Age: 49
Radiologist at Rigshospitalet

What is innovation?
"I have been involved in several innovation projects and I am happy to give my input when needed. It is fun to help molding the results and see the benefits for the patients after implementation. I believe my department gives the best radiology examinations in Denmark"

Innovation drivers
 - Improved patient experience
 - Pride and recognition
 - Open to trial and testing
 - General interest in new technologies

Innovation barriers
 - Limited time
 - Navigation: which projects should he work with?
 - Repetition: delivering same advise to several entrepreneurs, when contacted.
 - Lack of innovation frameworks and tools

Astrid Laugesen

Age: 28
Nurse at Hvidovre Hospital

What is innovation?
"Innovation is initiatives with the intention to make us more efficient. We are running fast every day and I am grateful if some sort of robot can help us and make the hospitals smarter. I am just not sure I can contribute with anything as I do not know much about new technology."

Innovation drivers
- Improved patient experience
- Process efficiency
- Non repetitive work tasks

Innovation barriers
- Hierarchy
- Traditions and habits in the department
- Limited time
- Lack of innovation frameworks and tools

Simone Palmer

Age: 64
Senior surgeon at cardiovascular department at Herlev Hospital

What is innovation?
"Innovation is 'smart ideas' developed by people outside the hospital who does not understand the actual practice in my department. It is forced on us from above until they realize that it does not fit here and then they try out their next smart idea. It steals my time and focus from what is really important: my patients."

Innovation drivers
- Improved treatment quality
- Pride and recognition
- Improved equipment
- Improved patient experience

Innovation barriers
- Limited time
- Traditions and habits in the department
- Focused on research within her speciality
- Still adapting to Sundhedsplatformen changes
- Lack of innovation frameworks and tools

HOSPITAL INNOVATION ECOSYSTEM

The users of Hospital Innovation Hub are embedded in an ecosystem of hospital innovation that defines their conditions and opportunities. Research gathered for the design of the service showed that there are minimal structure of whom to involve, partner up with or seek information from when innovating inside the hospitals. It appeared to be surprisingly random/individual how the innovation traveled from problem identification to implementation and who was involved during this process.

In general, the ecosystem is very complex and it was difficult even for the hospital innovation experts involved in the process to map the different players and what their roles and interaction are. The ecosystem stakeholders are therefore displayed spread over with no with no clear links or system.

The stakeholders are categorised based on the political layer/hierarchy they operate in, ranging from research and education, municipal level, regional level, national level and international level.

Each stakeholder in the ecosystem are involved in hospital innovation either when initiating the process themselves, via collaboration across several stakeholders or, in some cases they are invited to join and contribute to a design process initiated by the hospitals.

What was crucial to explore and visualise in the ecosystem is the hospitals' internal resources dedicated to hospital innovation. The pink iconography therefore shows which hospitals have innovation units and where the innovation are initiated and carried out amongst the healthcare professionals within individual departments.

Hospital Innovation Ecosystem
For somatic hospitals in Capital Region, Denmark

■ Innovation unit
▲ Department-driven innovation

International actors/network	(EIT) European Institute of Innovation & Technology		Institute for Healthcare improvement			(NI) Nordic Network of Test Beds	
National actors/network	Center for Research & Innovation	Forskningsrådet for Sundhed & Sygdom	Hospitals in other regions	Medtech innovation	Danish Society for Patient Safety	Welfare Tech	**Triple Helix Health Innovtion**
Regional actors/network	Center for Regional udvikling - Vækst & Viden Sund Vækst - collaboration between Copenhagen Municipality, hosptitals, private companies etc. VihTek - Testing, developing and implenting welfaretechnologies at hospitals in the region						
Municipal actors/network	Velfærdsinnovation, Københavns Kommune						
Research & Education	Scion DTU	Sundhedsinnovation (Copenhagen University)		SUND hub - coaching innovative students		Metropol	

Rigshospitalet

Nordsjællands Hospital

Herlev/ Gentofte Hospital

Bornholms Hospital

Amager/ Hvidovre Hospital

Bisbebjerg Frederiksberg Hospital

Copenhagen Health Innovation For health professionals, educators & students

Copenhagen Healthtech Cluster For Business professionals

Copenhagen Centre for Health Technology For scientists

WHAT

VALUE PROPOSITION

Improving hospitals worldwide by sharing ideas, frameworks and know-how with peers and experts across the hospital sector.

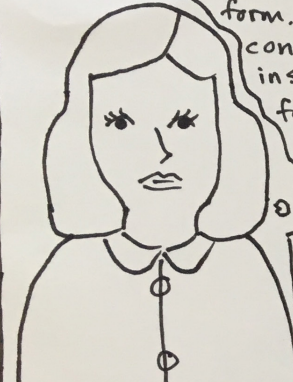*We need to think together to think big and innovate efficiently.*

STORYBOARDS

The following storyboards are two cases of using the service. It showes the contextual details of Hospital Innovation Hub and how a successful user experience could proceed. The storyboards shows two different situations:
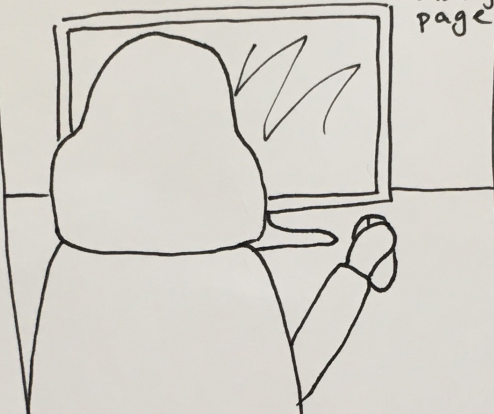
1) First time use

2) Leapfrogging

Open Innovation Platform - Leapfrogging

Innovation manager Becky receives a mail from her director...

Dear Becky,

We succeeded in getting the funding DKK 8.00.000 for modernizing the Pediatric section.

Will you submit a prioritized list of potential improvements next week Friday?

Becky logs on to Open Innovation Platform for inspiration...

Pediatric

GO

Top rated #Pediatric

Add filters   78 in total

cutting cost

patient experience

new technologies

process efficiancy

easy implementation

Becky browses through cases and chooses five to further investigate.

Each case has a format that makes it easy for Becky to understand the values, challenges and details. The comments below the cases are often from piers who add interesting value or reflection.

What a time saver!

Becky eventually prints out four cases and adds her comments on local implementation. She is excited to hand it over to her director.

HOW

SERVICE BLUEPRINT

Hospital Innovation Hub is the result of numerous coordinated actions involving the users and other relevant stakeholders.

The processes and their interrelations are displayed in the service blueprint on next page. It gives a holistic view of the service elements.

SERVICE BLUEPRINT

		AWARE	FIRST TIME USE	DAILY USE

		Touchpoints	- Hospital innovation event - Social media	Website	Website

Frontstage

User action	Get to know about service	Enter website & browse it	Set up profile	Browse innovations	Add likes & comments to innovations	Access roadmaps, framework & tools	Add innovations	

Existing users				Add innovations	Browse innovations		Add likes & comments to innovations	

Capital Region	Ambassador role: Service presentation							

Backstage

IT Infrastructure			Store new users on ID storage				Generate data statistics on innovations	

Office	-Provide Service presentation -Instruct ambassadors			Update relevant hashtags			Receives statistics data	

Insights

Questions				How "old" are the innovations allowed to be?			What would be the best use of statistics?	

Potential Pitfalls				If the innovations are not inspiring/ appealing enough		If toolbox is not relevant/professional enough		

STRATEGIC ALLIANCE

OPEN CALL

Website

Website

Website

Update the hospital's roadmap

Present problem & idea for solution

Source strategic partners

Choose partner(s) & customize contract

Show interest & join ideation dialogue

Submit solution proposal

Update the hospital's roadmap

Show interest & start partner dialogue

Show interest & join ideation dialogue

Add likes & comments to proposals

Access to overview on roadmaps

Frame problem & project details

Choose solution & project partners

Line of visibility

Publish problem for relevant users

Publish problem for relevant users

Encourage Open Calls

Should the service support this step?

Who are allowed to add Open Calls? Private/Public?

If roadmaps are outdated

If no one shows interest or timing is bad

If serious problems occur between partners

DIGITAL PROTOTYPE

Hospital Innovation Hub is a digital platform. A service prototype has been developed to illustrate the different features in the service.

An interactive version of the prototype can be found on this link: https://xd.adobe.com/view/629820ee-51f7-4851-6b57-ccffda0d09db-14a9/?-fullscreen

The design team invites you to browse through and get an idea of the potentials. It is not a final product but it can be used as a foundation for the design process.

Landing page

Hospital Innovation Hub

About   Ideas   Framework & tools   Log in or sign up

A platform for co-creating hospital improvements by sharing ideas, frameworks and know-how

Join the co-creation of the future hospitals
Connect with hospital professionals to ideate, design and deliver better solutions, faster. Get quick answers to your questions and have productive, spontaneous conversations with peers and experts across the hospital sector.

Customizable toolbox for hospital innovation
Get access to the best frameworks & tools designed specifically for hospital innovation

About

About   Ideas   Framework & tools | Log in or sign up |

Vision for Hospital Innovation Hub

It takes a collaborative approach to solve the complex health challenges of the future. Hospital Innovation Hub offers a platform for hospital staff to improve the hospital practice via co-creation. Hospitals hold a great variety of specialized knowledge that should be the foundation of the innovative solutions that will define our future healthcare system.

We invite you to join the co-creation and share your ideas, experience and input to further improve the hospital practice.

Statistics

Ideas: 432

Users: 611

Comments: 2185

Strategic
partnerships: 49

Project partners

Nordic Innovation   MINISTRY OF HEALTH   AALBORG UNIVERSITY HOSPITAL   The Capital Region of Denmark   Healthcare DENMARK

Contact   About Hospital Innovation Hub   Funded by

Before signing up, potential users can learn about the service by reading the vision, seeing the project partners and browsing through examples of ideas posted by other users.

The aim is to impress and create a feeling of identification. The elements should signal that the service is professional, ambitious and informative. The option to filter and categorise the content will give the user what it needs rather than sitting with a feeling of getting too much information.

Ideas

Hospital
Innovation
Hub

About   Ideas   Framework & tools | Log in or sign up |

Browse through the ideas and join the further development

Natural light lamps

Anders Sode West
Læge og ph.d.
Rigshospitalet Glostrup

14   48
Light lamps that follow the natural sun spectre proves to increase patient mood in Rigshospitalet Glostrup.
Added by Anders Sode West on 31.08.2018
#patient-care

Chemo at home

8   87
Offering patients chemo treatment at home via a portable bag instead of the normal hospital admissions.
Added by Katrine Fridthjof on 07.11.2017
#Chemo-treatment

xxx

93   69
65   70
81   118/80 (100)

23   56
xxx
Added by xxx on xxx
#xxx

Apply filters

| Search ideas… | 🔍 | | most liked ▾ | | 15 ▾ |

Chemo at home
Innovation stage: Diffusing   8   87
Rigshospitalet offer patients to receive chemo treatment in their homes via a portable bag instead of the normal hospital admissions.
Added by Katrine Fridthjof on 31.08.2018   #Chemo-treatment

XXX
Innovation stage: Ideating   23   56
xxx
Added by xxx on 31.08.2018

Natural light lamps
Innovation stage: Implementing   14   48
Natural light lamps that follows the sun spectre proves to increase patient mood in Rigshospitalet Glostrup.
Added by Anders Sode West on 31.08.2018

My activity

☐ Following
☐ Not viewed
☐ Viewed
☐ Commented on
☐ Liked

Categories

☑ All Categories
☐ Cutting cost
☐ Patient experience
☐ New technologies
☐ Process efficiancy
☐ Plug & Play

| Search hashtags… | 🔍 |
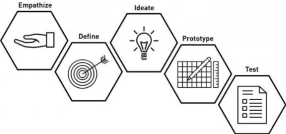
#VR   #chemo-treatment
#front-loading   #wayfinding
#self-care   #waiting-room

Framework & tools

Log in

Frameworks and tools designed specifically for hospital innovation will be available for the users. The user research conducted for Hospital Innovation Hub stated a clear need for optimising and harmonising the methods used for hospital innovation. The facilitators are simply not equipped with suficient framework and tools.

Ideas (after log in)

Hospital
Innovation
Hub

Ideas   Roadmaps   Open Calls   Framework & tools   Becky

🔍 Browse ideas

✏️ Share idea

Newest ideas

Open Call

◀

Natural light lamps   14 💬 48 👍
Natural light lamps that follows the sun
spectre proves to increase patient mood.
Added by Anders Sode West on 31.08.2018

Chemo at home   8 💬 87 👍
Patients receive chemo treatment in their
home via a portable bag
Added by Katrine Fridthjof on 07.11.2017

XXX   23 💬 56 👍
XXX
Added by xxx on 31.08.2018

▶

Search ideas

| Search ideas… 🔍 | most liked ⇕ | 15 ⇕ |

🎬 **Chemo at home**   👁 8   💬   87 👍
Innovation stage: Diffusing

Rigshospitalet offers patients to receive chemo treatment in their homes
via a portable bag instead of the normal hospital admissions.
Added by Katrine Fridthjof on 07.11.2017

#Chemo-treatment   **Join discussion**

🎬 **XXX**   👁 23   💬   56 👍
Innovation stage: Ideating

XXX

Added by XXX on xxx

#xxx   **Join discussion**

🎬 **Natural light lamps**   👁 14   💬   48 👍
Innovation stage: Implementing

Natural light lamps that follows the sun spectre proves to increase patient
mood in Rigshospitalet Glostrup.
Added by Anders Sode West on 31.08.2018

#patient-care   **Join discussion**

My activity

☐ Following
☐ Not viewed
☐ Viewed
☐ Commented on
☐ Liked

Categories

☑ All Categories
☐ Cutting cost
☐ Patient experience
☐ New technologies
☐ Process efficiancy
☐ Plug & Play

| Search hashtags… 🔍 |

#VR   #chemo-treatment
#front-loading   #wayfinding
#self-care   #waiting-room
more...

Contact   About Hospital Innovation Hub   Funded by

Share idea

Hospital
Innovation
Hub

Ideas   Roadmaps   Open Calls   Framework & tools   Becky

🔍 Browse ideas

✏️ Share idea

| Headline | Innovation stage (Problem, Ideating, Developing, Implementing, Diffusing) |

Upload 90 sec video
presenting the
idea

Short Description

Value for patients	Core Learnings	Cost savings
Value for staff	Core issues	Time savings
Collaborators	Suppliers	Contact info

Add hashtags...   **Share**

Contact   About Hospital Innovation Hub   Funded by

After signing up the users can join discussions linked to each idea or problem. Each ideas will be strengthened or challenged via joined discussion across the users. It saves the user time and ressources as the learnings from other hospitals are applied.

When sharing an idea or problem the user defines and categorises it based on predefined parameters, e.g. the innovation stage of the idea, the value for patients etc. A short video is linked to each idea to ensure a quick basic understanding from the other users. This way Hospital Innovation Hub offers easy comparison, leapfrogging, and accelerated opportunity mapping for its users.

Roadmaps

Open calls

The Roadmaps feature offer an overview of current and future projects on other hospitals. The database will automatically scan for parallel projects and notify the implied hospitals. The feature creates transparency between the hospitals and invite for increased collaboration across the sector.

All involved hospitals will fill out and continuously update a roadmap for their innovation projects, including subjects that they wish to further explore.

Open calls are design sprints amongst the users focused on solving a specific problem. They will be initiated and funded by an external institution, who benefits from the accumulated know-how in Hospital Innovation Hub. The open call will provide gates and deadlines to accelerate the process.

The design sprints will run in predefined phases followed by clustering of ideas, commenting, voting and choosing.

The Open Calls are for service awareness and to maintain the service attractiveness.

Profile view

Each user profile will show the user's activity in the service. This will offer the users an opportunity to expose themselves in the hospital innovation community. A user will stand out more attractive when involved in a great portion of projects. This will provide an incentive for the users to be active.

PLAN FOR IMPLEMENTATION

Preparation is needed before the Hospital Innovation Hub can be launched. The plan below is a list of actions to initiate prior to service implementation. The action points should not be initiated chronologically but parallel and in an agile project approach. The ambition should be to further involve and co-create the service with key stakeholders in the hospital innovation ecosystem.

A trial period within one or two regions is recommended to ensure final refinements before launching nationally and thereby involving all hospitals in Denmark.

1. Funding and ownership from public or private institution(s), preferably from trusted actors and with full transparency on who funds what.*

2. Involve Danske Regioner and all hospital directors to secure support and ownership. Commitment includes appointing local representatives who are responsible for the hospital's service engagement.

3. User research and involvement has been concentrated on one user group during the service design. Increased involvement with other user groups are needed to achieve a deeper understanding of their drivers and barriers to use the service, plus how they are successfully reached.

4. Engage a design thinking agency, preferably specialized in healthcare innovation to design the hospital Innovation frameworks, tools and templates. This process should involve innovation managers from across the hospital innovation ecosystem.

5. Build application.

6. Explore the opportunity to link Hospital Innovation Hub to existing systems in the hospitals, e.g. Sundhedsplatformen.

7. Plan first Open Call for service kick off in collaboration with suitable actor.

*When asking the potential users of Hospital Innovation Hub suitable candidates include Danish Healthtech, Danske Regioner, Forum for Forskning, Innovation og Regional Udvikling (FIRU), Center for Offentlig Innovation, Innovationsfonden and Nordic Innovation.

APPENDIX A: INTERVIEW GUIDES

Interview guide: Thit Fredens
Title: Consultant at department for Welfare innovation, Health and Care governance at Copenhagen Municipality. Past: Innovation consultant at Research & Innovation at Capital Region. Leading project "Videnbrokernetværket"

Intro til Speciale:

Navn og titel?

Åbne spørgsmål om sundhedsinnovation:
Hvad er din relation til sundhedsinnovation?

Hvad er din erfaring med innovation på hospitaler?

Hvordan udvikler man praksis på hospitalerne for at sikre effektivitet, kvalitet og teknologiudvikling?

Hvordan indsamles ideer til udvikling/innovation?

Kommer ideerne fra...
INTERNT
Personale?
Patienter?
EKSTERNT
Innovationskonsulenter og tænketanke?
Virksomheder/produktinnovation
Andre hospitaler i Regionen?
Andre hospitaler i DK?
Udenlandske hospitaler?

Er/var der innovationsenheder på alle hospitaler i Region Hovedstaden?

Hvordan kommunikeres der om innovation på tværs af hospitalerne?
I regionen?
I Danmark

Er de åbne/lukkede?

Er der konkurrence hospitalerne imellem?

Om vidensbrokernetværket:
Hvad var baggrunden for at starte det?
Hvad var resultatet?
Hvorfor blev det ikke til en permanent løsning?
Hvad var de vigtigste læringer?

Refleksioner omkring samskabelse på tværs af hospitaler
Samarbejder hospitalerne om at udvikle best practices? Hvad er et smart, effektivt hospital for patienter og medarbejdere?
Skuer de til udlandet for udviklings-ideer?
Er der ligheder på afdelingerne på tværs af hospitalerne? Fx. børneafdelinger/brystkirurgisk osv.?
Kunne hospitalerne samarbejde mere omkring udvikling?
Barrierer?
Fordele?
Kan du forestille dig, at

Interview guide - Thomas Hammer Jakobsen

Navn og kort om, hvad du arbejder med?

Hvad er din erfaring med sundhedsinnovation?

Har du samarbejdet direkte med hospitaler i DK?
Hvad er dine erfaringer?
Hvad er udfordringerne?

Hvordan får du indsigt i hospitalernes innovationsbehov?

Når en hospitalsinnovation implementeres med succes, hvordan spredes den til andre?
DK og udlandet?

Hvad er din fornemmelse, kigger hospitalerne til udlandet efter innovative løsninger?

Er det muligt at udvikle innovationsløsninger på tværs af hospitaler?

Platform for Health Tech industrien
Hvad er formålet?
Hvem er brugerne?
Hvad er status?

TEST af scenarier

Præsentation af ide

Hvad er potentialet?

Hvad er ifølge dig de primære barrierer?

Interviewguide: Peter Aagaard Nielsen
Innovation and Organisational Development Manager - Rigshospitalet

Navn og kort om, hvad du arbejder med?

Er du ansvarlig for alle innovationsprocesser på Rigshospitalet?

Hvordan udvikler man og forbedrer praksis på Rigshospitalet for at sikre effektivitet, kvalitet og teknologiudvikling?

Hvordan holder du dig ajour med udviklingen af:
Teknologi?
Hospitalsudvikling/succeshistorier på andre hospitaler?

Hvad er proces fra ide til udvikling og implementering?
Kan du lave en simplificeret tegning over processen?

Hvordan indsamles ideer?

Hvordan struktureres ideerne?

Hvor udvikles/prototypes?

Kommer ideerne fra...
INTERNT
Personale?
Patienter?
EKSTERNT
Innovationskonsulenter og tænketanke?
Virksomheder/produktudvikling
Andre hospitaler i Regionen?
Andre hospitaler i Danmark?
Udenlandske hospitaler?

Kan vi sætte procenter på ovenstående?

Hvor kommer de bedste ideer fra?

Er der fordele ved at ideerne kommer internt fra?

Hvordan proriteres ideerne?

Har I et roadmap over, hvad I vil igang med at forbedre/effektivisere?

Mon ikke mange andre hospitaler står med lignende problemstillinger?

Hvordan kommunikerer Rigshospitalet om innovation med...
Andre hospitaler i Regionen?
Andre hospitaler i Danmark?
Udenlandske hospitaler?

Hvor ofte samarbejder I med andre hospitaler om at skabe en fælles løsning?
I regionen?
Danmark?
Udlandet?

Er der konkurrence hospitalerne imellem?
Regionerne imellem?
Lande imellem?

Strategiske samarbejder med udlandet/andre hospitaler/regioner
Hvordan kommunikerer I?
Hvem tager kontakt?

Hvad har projekter som Ideriget lært jer?

Kan du forestille dig at dele ideer, forbedrings-roadmaps, modne ideer sammen, sparre og videreudvikle hinandens ideer? Inspirere hinanden og udvikle

en best practice?

...både med andre hospitaler i og uden for DK?

Best practice fx. I wayfinding, i indretning af venteværelser, i patientkommunikation/forløb?

Forestil dig fx at alle radiologiske afsnit udvikler ideer sammen... alle fødemodtagelser... alle børneafdelinger...

Co-designing Open Innovation Platform
April 10, 2018

1) Introducing service goals

2) Introducing personas

3) Service journey exercise
Aim: to understand the service experience from the users' viewpoint.
Rather get detailed info about one than touching surface only of them all.

Walk through the different elements
Questions:
Touchpoints?
Pain points?

SERVICE TESTING
Hospital Innovation Hub
Prototype version 1.0

[Kort intro til service koncept, design proces samt status lige nu.]

Forventninger til interview:
-      Det er første prototype på en service. Dvs. det er ikke små visuelle detaljer jeg vil gøres opmærksom på. Det er det generelle service koncept, jeg vil teste. Appellerer det til dig? Kunne det afdække nogle behov fra dig? Kan du slet ikke se pointen osv.
-      Jeg har tænkt mig at gennemgang prototype, hvor jeg viser dig rundt. Du må meget gerne afbryde mig undervejs med spørgsmål og du må også gerne spørge ind, hvis der er noget der undrer dig. Efter gennemgangen kan vi gennemgå nogle af elementerne igen, hvis der var noget særligt, der interesserede dig. Ellers kan vi gå direkte til mine spørgsmål.

[Gennemgang/guidet tour af prototype elementerne]

Med dine ord, hvad er så formålet med servicen?

Hvad er dine umiddelbare tanker om servicen?

Er der nogen værdi for dig i at bruge den?

Hvad skulle der til for at du ville bruge servicen jævnligt?

Er der nogle funktioner, der var særligt interessante for dig?

Var der elementer, der virkede overflødige?

Hvorfor ville du vælge den fra?

[Kort præsentation af personaer]

- hvad ville hver især sige til servicen?

- Hvilke funktioner ville være værdifulde for dem og hvorfor?

Ville du dele Rigshospitalets innovationer?

- ville de andre personaer?

Ville du kommentere på de andre innovationer?
Ville du dele, hvis noget er slået fejl, men der stadig kan læres fra det?

Kunne du forestille dig at udvikle mere i samarbejde med andre hospitaler med de samme behov? Fordele/ulemper?

Ville du lave nogle ændringer?

Var der noget information, der manglede?

Hvilken type brugere ville du håbe at komme i dialog med?
 - klinikere, andre innovatører med erfaring, internationale

Hvad synes du om service navnet? Hvad associerer du det med?

Bør jeg hellere kalde innovationerne for ideer? Forbedrende initiativer?

Hvilke værktøjer ville være værdifulde at finde på hjemmesiden og hvem skulle udvikle dem?

Hvem vil (og bør) tage ejerskab over sådan en service? Hvem skal jeg sælge den ind hos?

Hvad er mine udfordringer, hvis jeg ønsker at gå videre med dette service koncept?

APPENDIX B: LIST OF INNOVATION ACTORS IN DENMARK

Health Innovation actors in Denmark

International
European Institute of Innovation & Technology
Institute for healthcare improvement - Non-profit leading innovator, convener, partner, and driver of results in health and health care improvement worldwide.

Nordic
Nordic Network of Test Beds (Nordic Innovation)

National
Center for Research & Innovation - advising Hospitals with finance, negotiations, contracts etc.
Forskningsrådet - Sundhed og Sygdom
Medtech Innovation - national network, establishing public/private innovation partnerships
Danish Society for Patient Safety

Region Nordjylland
•Ideklinikken på Aalborg Sygehus
•Forskningens Hus på Aalborg Sygehus
•Virtuelt Center for Sundhedsinformatik (V-CHI) på Aalborg Universitet
•BrainsBusiness er et stort privat/offentligt partnerskab på IKT-området
•Klyngen BioMed Community
•Center for Velfærdsinnovation og –Teknologi.

Region Midtjylland
•AU Inno-X
•Patent- og kontraktenhed. Region Midtjylland og Århus Universitet

•MedTech Innovation Consortium
•Caretech
•Innovationsenheden MidtLab

Region Hovedstaden

Triple Helix Sundhedsinnovation:
•Copenhagen Health Innovation (Region Hovedstaden, Københavns Kommune, Københavns Universitet, Copenhagen Business School, Danmarks Tekniske Universitet og Professionshøjskolen Metropol har indgået aftale om at lave et "Copenhagen Health Innovation" - en ny satsning på uddannelse inden for entreprenørskab og sundhedsinnovation.)
•Copenhagen Healthtech Cluster (facilitate collaboration between companies and healthcare sector)
•Copenhagen Center for health technology (Strategisk samarbejde mellem Region Hovedstaden, DTU, KU SUND og Københavns Kommune om at udvikle sundhedsteknologi og produkter med udgangspunkt i evidensbaseret teknologi forskning.)

Source: http://www.cphhealthtech.dk/om-chc/partnere

•Forskning & Innovation
•Center for Regional Udvikling
•Vihtek
• Velfærdsinnovation, Københavns Kommune
• Sund Vækst. Welfare Technology. Collaboration between Copenhagen Municipality, hospitals, private companies etc.
• DDC
•Copenhagen Living Lab
•Sundhedsinnovation (Copenhagen University)
•SUND Hub - coaching for students with healthcare innovation ideas
• Department of Public Health, University of Copenhagen
•Scion DTU

Region Sjælland
•Enhed for innovationsfremme
•Offentligt-privat innovationspanel (OPI-panel)
•Projektstøtte- og administrationsenhed
•Techtransydelser og juridisk forskerservice

Region Syddanmark
•Tech Trans enhed på Odense Universitets Hospital.
•Forskerservice. Region Syddanmark samarbejder med Syddansk Universitet
•Erhvervsklyngen Welfare Tech Region
•Den digitale behovsbørs INVIA
•Enheden for Velfærdsinnovation
•Innovationscenteret for brugerinddragelse i sygehusbyggeri.
•Velfærdsteknologi.nu fungerer som en samlet paraplyorganisation
•Laboratorium for offentlig-privat innovation (OPI-lab).

APPENDIX C: SESSION LOG

Session Log, Thesis

November-December 2017
Scoping main interest: healthcare sector
Desk research (innovation, tendencies, problems)
Informal meeting with Anne Danielsen, project manager at DDC Health platform.

02. January 2018
Agenda
Research on healthcare sector needs
Zocdoc: American booking system of therapeuts - how would similar system work in Danish context?

Notes: Zocdoc cannot work in Danish context because of political issues.

05. January
Desk Research

08. January
Expert interview with Rune Holdt, Head of Innovation & Technology at New Hospital North Zealand (non-structured, explorative)

11. January
Initial analysis: Healthcare innovation platform
What, Why, Who, How
SWOT analysis

Desk research: Healthcare innovation, co-creation in healthcare, platforms for innovation. open innovation. Innovation actors in Danish Healthcare sector

18. January
Expert interview with Anne Danielsen

07. February

Initial problem statement
How can a service system provide optimal conditions for co-creation/open innovation within Healthcare?

Keywords: Open innovation, Health innovation, co-creation, design thinking, service design

13. February
Overview: Health innovation ecosystem in Denmark
Main stakeholders? Dynamics? Collaboration across?

14. February
Supervision #1
Building scrum board

20. February
Choosing to look at the stakeholder ecosystem as innovation coming 1) from within or 2) from outside the hospital
Drafting first ecosystem
Contacting:
Michel Nemery
Eskild Nielsen
Peter Aagaard Nielsen

21. February
Contacting:
Thomas Hammer-Jakobsen: Copenhagen Living Lab
Thit Fredens

Userdriven innovation

28. February
Expert Interview: Thit Fredens, Consultant at department for Welfare inno-
vation, Health and Care governance at Copenhagen Municipality (interview
guide)

29. February
Expert interview: Peter Aagaard Nielsen, Innovation and Organisational De-
velopment Manager - Rigshospitalet (interview guide, quote cards, test of

TO DO LIST
Process overview
Mapping the network in Capital Region
Transcribing two interviews
Journey of the breastcancer hometreatment concept
Autonomy in hospitals

6. March
2nd supervision
Questions:
Open innovation / co creation platforms?

8. March
Interview: Nana Levann, Nurse at Herlev Hospital

8. March
Stakeholder Ecosystem two versions
13. March
Analysing interviews
Findings

15. Marts
Preparing co-design session with Rune Holdt:
Preparation exercise
Key findings poster
Three scenarios - discussing pro's and con's
Drawing storyboards together
Personas

Aim: Identifying biggest need.

22. Marts
3rd supervision

23. Marts
Interview: Thomas Hammer Jakobsen
Testing scenarios

28. Marts
Refining scenarios
Building personas

05. April
4th supervision
Check Point at AAU

06-09. April
Prepare materials for co-design session:
Introduction and service goals
Scenarios
Persona poster
Service journey poster x4

10. April

Co-design workshop: Building service journeys
Rune Holdt

12. April

20. April
Storyboarding: Use cases
21. April
Redefine target group

26.- 29 April
Writing text for Discover phase
Refine problem statement:

How might a service system support innovation actors in the hospitals of
Capital Region when improving their hospital practice together?
3. May - 4. August Break

5. August
Supervision
Planning new meetings

Start up to do:
Read session log
Go through all docs
Clean out DDC computer

Healthcare Innovation

Defining **Innovation in health**: a novel drug, device, app, model of care, set of behaviours or way of working that is directed at improving outcomes, efficiency or experience. These innovations can range from incremental to radical.
Innovation Unit 2018

Process Plan

Discover	Define	Develop	Deliver	Report

January	February	March	April	May

Supervisions   SV1   SV2   SV3   SV4   SV5   SV6   SV7

Key dates   Litterature   Check   Hand In

Search   Point
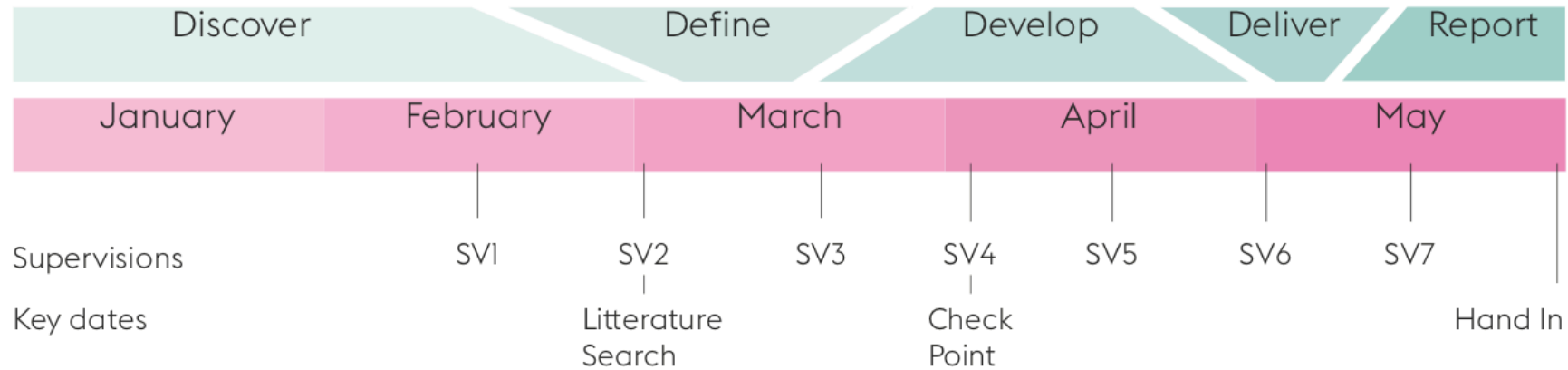
Research

Interviews

Rune Holdt
Head of Innovation &
Technology
NHN

Nana Levann
Nurse
Herlev Hospital

Peter Aagaard Nielsen
Director of Innovation
Rigshospitalet

Anne Danielsen
Project Manager
Health Platform
Danish Design Centre

Thit Fredens
Consultant
Vælfærdsinnovation
Copenhagen Municipality

**Thomas Hammer
Jakobsen**
Head og Lab
Copenhagen Living Lab

Observations

Rigshospitalet

Nyt Hospital
Nordsjælland

Desktop Research

Key learnings

▶ There is limited organizational structure or support for innovation in hospitals.

▶ Innovation is most often initiated and carried out by enthusiastic employees fueled by intrinsic motivation/commitment.

▶ Best ideas derive from inside the hospitals - based on actual needs and easy to implement.

▶ There is very little openness and collaboration about innovation between hospitals in Denmark.

▶ Scaling of successful innovation happens based on individual networks.

▶ Hospitals and its departments work autonomously and are a product of traditions and habits plus the composition of employees. The innovation needs local adjustment.

▶ Qualitative as well as quantitative evidence is often necessary to build demand and support for innovation

▶ Change in hospitals means high transaction cost and complex decision processes.

Hospital Innovation Ecosystem
For somatic hospitals in Capital Region, Denmark

■ Innovation unit
▲ Practitioner-driven innovation

International actors/network

(EIT) European Institute of Innovation & Technology

Institute for Healthcare improvement

(NI) Nordic Network of Test Beds

National actors/network

Center for Research & Innovation

Forskningsrådet for Sundhed & Sygdom

Hospitals in other regions

Medtech innovation

Danish Society for Patient Safety

Welfare Tech

Triple Helix Health Innovtion

Regional actors/network

Center for Regional udvikling - Vækst & Viden

Sund Vækst
- collaboration between Copenhagen Municipality, hosptitals, private companies etc.

VihTek
- Testing, developing and implenting welfaretechnologies at hospitals in the region

Rigshospitalet ■ ▲

Nordsjællands Hospital ■ ▲

Herlev/ Gentofte Hospital ▲

Bornholms Hospital ■ ▲

Amager/ Hvidovre Hospital ▲

Bisbebjerg Frederiksberg Hospital ▲

Copenhagen Health Innovation
For health professionals, educators & students

Copenhagen Healthtech Cluster
For Business professionals

Copenhagen Centre for Health Technology
For scientists

Municipal actors/network

Velfærdsinnovation, Københavns Kommune

Research & Education

Scion DTU

Sundhedsinnovation (Copenhagen University)

SUND hub
- coaching innovative students

Metropol

Problem statement

How might a service system enable co-creation of hospital improvements and innovation across innovation actors in Danish hospitals?

Open Innovation Platform

- Sharing improvement initiatives/innovation/best practice across Hospitals

- Enabling co-creation across sector

- Maturing/choosing/testing/refining innovation ideas via input from piers and professionals

- Strengthening healthcare sector collaboration nationally and globally

- Sharing learnings from implementation

- Developing strong and scalable concepts for improvement

- Better use of resources: Making hospital innovation quicker, cheaper, better directed towards already-identified areas of need, and more widely adopted and diffused.

Building scenarios

Scenario 1

Innovation manager Becky from Herlev Hospital has been urged to reorganize the … department as the facilities and equipment is outdated. She looks at *Open Innovation platform* to get inspiration and sees that a similar size hospital in Rotterdam has just finalized a restructuring in that same department that will reach break even after 2,5 years. This is due to … which will be spent much more efficiently.

When presenting this opportunity for her director Becky gets a go ahead as it …

She discovers on *Open Innovation platform* that Randers hospital are looking for strategic partnerships to improve their … department. Becky reaches out and after two meetings the two hospitals have come up with a shared vision for the project inspired be the Rotterdam case.

After implementing the changes Becky adds her comments to the Rotterdam case on Open Innovation platform as her team found a supplier of equipment that saved 35% of the cost without compromising on quality. This info is hereby available for other users of *Open Innovation platform*.

Scenario 2

Doctor Mario in … has experienced problems with … for the past year. During a conversation with his cousin who works as an Innovation engineer in the military he has heard about a new tech device that might be able to help with this problem if it is tweaked to the purpose.

Mario looks at *Open Innovation platform* and sees that two other hospitals in DK has expressed similar problem looking for solutions. He reaches out to both hospitals. With shared resources they put it out to tender and start testing the idea with the selected innovation team by prototyping it in Mario's lab.

The result is a big success that is implemented in all three hospitals. Mario shares the idea on *Open Innovation platform* and receives much credit from initiating such smart solution. Within a year it is successfully implemented to 12 hospitals worldwide.

Scenario 3

Nurse Astrid has been working in department … for three years. Almost twice a week during this period she has experienced that patients arrive late or miss their appointment because they get lost on their way there.

Astrid makes a quick calculation of lost resources due to this problem. She has heard about *Open Innovation platform* from a college and searches the platform for way finding solutions. Some are surprisingly cheap and easy to implement with extended documented effect.

Astrid adds what currently has the best rating on *Open Innovation platform* to her cost analysis and to her big surprise it equals the cost of two months wasted resources. She presents her findings for the management team who supports the implementation. Astrid is applauded internally for the great improvement to the department.
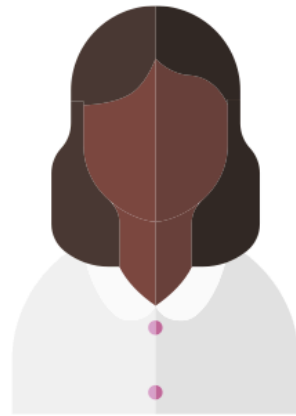
Pretotyping results

- Good case examples

- Unrealistic perception of time

- Broad/unclear definition of "ideas"

Reflection: great way of explaining the service.

Personas

Becky Magnussen
Innovation Manager at
Bornholms Hospital

Simone Palmer
Practitioner specialized
in breast cancer at
Herlev Hospital

Mario Rose
Radiologist at
Rigshospitalet

Astrid Laugesen
Nurse at
Hvidovre Hospital

Next steps

Co-design session on Tuesday
 - Service journey (for each persona?)
 -

Blueprint

Building mockup

Test & refine session x2