# NTNU

# Public Innovation

An empirical study of new services

in the Norwegian mental health sector

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# Special acknowledgements

# Abstract

Public innovations are easily shadowed by commercialized technology, but are nonetheless as important or even more, since they are the collective resources of the society that are going to serve us. The market may be profitable for commercial innovations, but profit is not the goal of public innovation. Mental health is a substantial factor in the workforce, economy and well being of a society. The focus on mental health has been trending the last decade and keeps growing as a matter of crucial importance in society. This thesis will look at the combination of these two subjects, public innovation in the mental health sector.

The study asks questions around how an idea is born in the public mental health sector and investigates the barriers encountered when it is further developed. The theoretical framework is based on literature from Design Thinking and Exploration vs. Exploitation, including different mindsets, thinking modes, problem types etc. Regarding Exploration vs. Exploitation, it's interplay and intricate balance has been researched. Primary data for this thesis has been acquired by a qualitative method with the geographical scope of the study as St. Olavs hospital in Trondheim, Norway. The findings are then analyzed in light of the theoretical framework of Design Thinking and Exploration vs Exploitation.

The key findings from the empirical interviews are that it is a wide specter of origin from the ideas, it has been from a political top-down agenda, observation by specialists, research and knowledge transfer. Most are from research and observation in the clinics. Common for the new services is that they have not originated from designated idea generation activities like Design Thinking, while there is continuous exploration of better solutions within routine activities. The barriers vary for each project, but there is always a need to convince stakeholders and get funding.

The thesis suggests establishing a team for supporting new services with specialized competence and simultaneously have space for experimentation, discussion and ideation for new services.

# 1. Introduction

The public institutions are constantly dependent on adapting to society's changes, even though there are no incentives of commercial profit. The government is responsible for the people's shared resources and innovating infrastructure and services according to their needs. Since the 90's, after a long period of disregard, the question of innovation in services has continued to grow in importance in the economic literature and political agendas (Gallouj et al., 2013).

The new field of "service innovation studies" attempts to separate itself from technologist and industrialist conceptions and highlight the role of "invisible" innovation in post-industrial economies, that is non-technological innovation in all its forms; organization, process, product, concept, social innovation, etc. (Gallouj et al., 2013).

Public institutions have been criticized for lacking innovation, and they are themselves aware that an improvement needs to be done (Forskningsrådet, 2018). There are several reasons for the lack of innovation in public services; the non market dimension, lack of competition, risk aversion, the nature of appropriation regimes and rigidity and bureaucratic inertia (Gallouj et al., 2013).

Mental health is a crucial challenge in society, both nationally and internationally. 30-50 % of the population in Norway will experience some kind of mental illness in their life, and during a year, about 20 % of grown ups will have a mental illness, according to the Public Health Report (2018) from the Norwegian Institute of Public Health (NIPH). The most common are anxiety, depression and drug abuse. Severe depression may lead to suicide, which is the second leading cause of death among 15-29 year olds, according to The World Health Organisation (WHO).

There has been a significant increase in prescriptions for antidepressants the last decades (Rønning et al., 2009). WHO concluded in its Global Burden of Disease study that depression causes the most lost healthy years of living in The West (Horton, 2007), which is the case in Norway according to NIPH. Many people are able to live a normal life with limited need for help

from health services even though having a mental diagnosis, while others have a need for thorough follow-up continuously or in periods.

Public innovation and mental health are in the researcher's perspective an overlooked area by entrepreneurship students, which is why this is chosen as an area of research for this thesis, in addition to its growing importance.

## 1.2 Purpose of study

Gallouj and Zanfei's paper "Innovation in public services: Filling a gap in the literature" (2013), specifically elaborates on both the theoretical and empirical gap. Gallouj et al. (2013) goes deeper in Ian Miles' analogy that services are the "Cinderella" of "innovation studies" (Miles, 1998), by saying public services are then the "Cinderella" of "service innovation studies".

Furthermore, Proctor et al. (2008) writes in their implementation research in mental health services that one of the most critical issues in mental health services research is the gap between what is known about effective treatment and what is provided to consumers in routine care. The case studies will explore the extent of focus on research for innovations.

### 1.2.1 Gap in literature

Regarding the theoretical gap, Gallouj et al. (2013) state: "Public sector organisations and their innovative activities are uncomfortable guests in innovation theories… innovation dynamics within public administrations remains a largely unexplored "black box" in these models and has been given only little attention, especially in economic literature. Even theories expressly dealing with innovation in services largely disregard the specific nature of public sector innovation." For example, public services are excluded from the scope of the OECD Oslo Manual and from its various revisions. This study intends to give this "black box" some attention and explore the innovation dynamics within the public sector and fill some of the gap in public innovation literature.

Brooks et al. (2011) writes in their research for key components of success in mental health innovation; service development innovation in mental health is viewed as a pressing need which is still relatively poorly understood, and that macro theories have been criticised for limited explanatory power and may not be appropriate for understanding local and fine-grained uncertainties of services and barriers to the sustainability of change. This study will focus on specific local cases of public service innovation and aim to reach an understanding of their nature in an early phase, including fine-grained uncertainties and barriers.

## 1.2.2 Research questions

The whole process of innovation in a public institution would be an interesting field of research, from the inception of an idea to development and eventually implementation and diffusion. But the scope of this is rather wide for one thesis to gain any useful data and insights. It is more beneficial in terms of in-depth insight to narrow the scope down to one of the innovation phases. The innovation phase of focus for this study will be the early phase.

The researcher will investigate the conception of a public service innovation by learning where and how the idea was born, how it was assessed and why it was chosen for further development. The researcher will investigate the first steps in the process of how the project is further developed with the driving forces behind it, for example whether the project was proactively driven by some internal motivation or if it was a response to some external requirements or pressure from users or policy makers. The research questions are:

1. *How do ideas for better services originate in Norwegian public mental health?*
2. *What are the barriers for new services in Norwegian public mental health services?*

An idea may be a simple improvement or a radical invention, but it is first when it is developed and has a value for users, it is called an innovation. The definition and scope of innovation are elaborated in the literature review. The intention is to explore the origin of an idea, if the idea is from bottom-up or top-down and if it's from user feedback, research, relations, policy makers, a combination or something else and what happens when it is assessed as a potential innovation. Finally, the study also has an overarching purpose of being a practical contribution to the staff working with innovation in mental health by revealing some applicable insights.

## 1.3 Structure of thesis

Chapter 2 describes the current situation of mental health in Norway, including its impact on the economy and utilization of public health services, then a description of public innovation in Norway is given.

Chapter 3 presents the theoretical framework. It begins with the definition of innovation, followed by Design Thinking with creative mindsets, thinking modes, problem types, creativity blocks, the creative process and approaches. The chapter ends with the theory of Exploration vs Exploitation and it's interplay.

Chapter 4 presents the research method, qualitative research, and argues for why it has been chosen. Thereafter, a description of how the primary and secondary data has been acquired is given. The chapter ends with a reflection of the method.

Chapter 5 presents the interviewees briefly followed by empirical findings from each case study. Chapter 6 then analyzes the empirical findings in light of Design Thinking and Exploration and Exploitation. Finally, Chapter 7 presents the insights from the analysis and implications for the mental health sector at St. Olavs hospital. The thesis is concluded with the limitations of the study and suggestions for further research.

# 2. Context

This chapter describes the current situation of mental health in Norway, including its impact on the economy and utilization of public health services, then a description of public innovation in Norway is given.

## 2.1 Mental health

Mental illnesses are estimated to cost Norway about 70 billion NOK each year[1]. This includes direct costs such as treatment in addition to indirect as disability benefits, shorter lifespan and inability to work. Sick leave and absence from a social workplace are viewed as one of the most fatal consequences of mental illnesses (Harvey et al., 2009). The main causes of sick leave are anxiety and depression (Henderson et al., 2005), and they are often recurring and long lasting (Knudsen et al., 2013). Returning to work provides better health (Thomas et al., 2005).

About a third of disability benefits are due to mental illnesses, both in Norway (Mykletun et al., 2009) and the OECD area (OECD, 2003). Mental illnesses have long been acknowledged as a central cause of absence from work (Stansfeld et al., 1995), but are often underreported (Thompson et al., 2000). An important notice is that mental illnesses occur on average 9 years earlier than somatic illnesses, thus affecting more productive years of life. A mental illness on top of a physical injury may be the critical factor that pulls one out of the workplace and into a long term sick leave (Henderson et al., 2011).

Around 7,0 % of men and 12,1 % of women between 18-79 years have had a consultation with their doctor or emergency room for depression the last 5 years. Treatments have proven effects of reversing or preventing the illnesses from worsening. A solid knowledge base is growing for good and effective psychological interventions for anxiety and depression (Hunot et al.; NICE, 2007; Helsedirektoratet, 2009).

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[1] regjeringen.no, Helse- og omsorgsdepartementet

However, there is also a need to help those with mental illnesses who have not contacted health services by themselves, studies show that these are many (Layard, 2006; Moussavi, 2007; Torvik, 2017). A survey in Nord-Trøndelag shows that only 13 % of those with symptoms of depression and 25 % of those with symptoms of anxiety have requested help (Roness, 2005). Out of those known to have a mental illness, treatment is still not a given. Another Norwegian study highlighted that 25 % of those with a mental disability have not received treatment (Overland et al., 2007).

This subchapter presents an important topic in society, and when the majority of health services are owned by the public, there is no doubt that there is a need for innovation in the public sector in order to have a thriving population and strong economy.

## 2.2 Public innovation

The Norwegian Ministry of Municipalities and Modernization states that there is still a need for a lot of work to be done on public innovation and its dissemination, and it should therefore be given higher priority, and more systematic efforts should be made to achieve the pace of change that the public needs in the future. Innovation should be a core activity of the public sector due to several reasons: It helps welfare services to improve and increase public value, respond to the expectations of citizens and adapt to the needs of users and increase service efficiency and minimise costs (Mulgan et al., 2003).

Innovation in the public sector is crucial in order to be able to address the economic and societal challenges it faces (Bloch and Bugge, 2013). But public innovation is demanding and complex as a political-administrative management system with a broad set of requirements, goals and values. The political system can be an important driver of innovation, but conflicts of interest and the need for unified and balanced decisions can also hamper innovation. Many of the social challenges must be solved across both disciplines and sectors of public enterprises, research communities, residents, civil society and business. Furthermore, it is essential that public innovation is firmly rooted in knowledge from research and public interests to sustain reliability to the government with good use of public resources (Forskningsrådet, 2018).

During the last decades, the pressure on the public sector to increase efficiency and improve performance has shifted towards a more challenging task; to develop and offer 'personalized' public services (Alves, 2013; Albury, 2005; Meld.St. 7., (2008-2009); Du Gay, 1993). The public sector is expected to offer services that are responsive to the individuals', as well as communities' needs and aspirations. Due to an increased diversity and heterogeneous society, which expects tailored and top-quality services, the traditionally labeled 'one size fits all' services, if they ever existed, are no longer relevant (Albury, 2005).

There is a need for more knowledge about the prerequisites for innovation and what is required to implement new solutions in the public sector. Many changes in the public sector take place without a systematic evaluation of whether the changes are actually better. Research efforts do not always meet the knowledge needs of municipal, regional and state actors, and the public sector also fails to make good use of relevant research (Forskningsrådet, 2018). Better cooperation between public sector and research communities with their respective international networks can contribute to a more enlightened public debate and lay the foundations for a more knowledge-based and innovative policy design, administration and service development. The attention public sector innovation has received from the research community has yet to reflect its importance (Potts et al., 2010; Mulgan et al., 2003).

The Research Council of Norway, which has overall responsibility for developing the research and innovation system so that the research communities can play a greater role in developing a more knowledge-based and innovative public sector, also states that there is no doubt a need for a change of pace in research and innovation efforts in and for the public sector, and that we must gradually approach a better balance between the innovation efforts aimed at business and the public sector. While the public sector accounts for half of the national economy, the private sector receives more than 90 % of the Research Council's annual funding for innovation, which results in more than 8,8 billion NOK in 2018.

There are few incentives in the public sector for innovation, the dissemination of good solutions and thus for implementing new solutions on a larger scale. Gradual change and improvement dominate the public sector. More extensive innovation is needed, i.e. major and more radical changes. Such innovation is more risky and can have unintended consequences or incur additional costs, before gains are made. This is particularly challenging for the public sector,

where the responsibility to innovate and the division of labor between companies and management levels is unclear. This means that there is a need for a political foundation of national, more systematic and holistic approaches in innovation efforts across sectors and levels (Forskningsrådet, 2018).

The government is currently strengthening its work on innovation in the public sector, but as mentioned, there is currently no common, holistic national policy for how we should facilitate innovation in the public sector, although many actors work with limited efforts in their field. The Association of Local and Regional Authorities did a large research in February 2019 of innovation in the municipality sector, and the Directorate for Management and ICT are requested to prepare a wide knowledge base on innovation both in the government and municipalities. Among other things, the research will look at what inhibits and promotes innovation, whether the organizational, educational, legal and financial tools needed to promote innovation are present. Or how management and leadership promote or inhibit innovation. In addition, international research and knowledge transfer is done, from the OECD area among others.[2]

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[2] The Norwegian Ministry of Municipalities and Modernization,
https://www.offentliginnovasjon.no/om-arbeidet/

# 3. Theoretical framework

This chapter begins with the definition of innovation among scholars, then presents the theoretical literature on Design Thinking and it's components and Exploration vs Exploitation and it's interplay.

## 3.1 Innovation

Innovation is a difficult phenomenon to define and despite the increased focus on innovation during the last four decades, scholars have yet to reach a consensus on how to define innovation. The origins of the word itself is from the Latin word *innovare*, and means to make something new (Storey and Salaman, 2005), but this could also be an invention. The term has further been defined in numerous ways, and its scope and meaning differs between literature regarding the private and the public sector. A vast literature exists that tries to pin down how innovation can be defined (among others OECD, 2005; Drejer 2004). Even if "there is no widely accepted or common definition of what counts as 'innovation'" (National Audit Office, 2006b: 4), there is agreement that innovation consists of two related activities: 1) doing something new, and 2) developing this new work in a given context. This is still not very precise, so we will look further into the definition, especially in the public sector.

The literature on innovation has been primarily focused on the private sector with an emphasis on product innovation (Cunningham and Karakasidou, 2009; Hartley, 2005). Innovation in the public sector can be more difficult to define, as it does not necessarily result in a new public service or offering, but also institutional renewal, process innovation, digitalization, or organizational improvements (Cunningham and Karakasidou, 2009). These improvements in the public sector might not be labeled innovations in the same manner as in the private sector. It is therefore important to be cautious when comparing literature on private sector to public sector innovation, as there are limitations to applying concepts from product innovation to service and organizational innovation (Hartley, 2005).

Moore and Hartley (2008) argue that innovations are more than mere ideas, and that innovations are new ideas and practices brought into implementation. This is in accordance with the definition used for the MEPIN study (Measuring Public Innovation in the Nordic Countries) as presented by Bloch (2011:14):

*"An innovation is the implementation of a significant change in the way your organization operates or in the products it provides. Innovations comprise new or significant changes to services and goods, operational processes, organizational methods, or the way your organization communicates with users. Innovations must be new to your organization, although they can have been developed by others. They can either be the result of decisions within [the] organization or in response to new regulations or policy measures."*

The MEPIN definition is recognized among several scholars (see for example Bloch and Bugge, 2013 and Arundel and Huber, 2011). In addition, the MEPIN study consisted of a survey and interviews with Nordic public organizations, which means the study provides grounds for comparison of the data from this study. However, a weakness with this definition may be the question as to when a change is significant. This is open to interpretation and could possibly lead to an ambiguous understanding of when a change constitutes an innovation or not. The MEPIN study goes on to establish a typology of innovations; product innovation, process innovation, organizational innovation, and communication innovation (Bloch, 2011).

With the white paper 'Et nyskapende og bærekraftig Norge' also known as 'Innovasjonsmeldingen' the Norwegian Government signaled that innovation would be a priority for the future, including the public sector (Meld.St. 7., (2008-2009)). The white paper used the following definition for innovation (Meld.St. 7., (2008- 2009: 13)):

*"A new product, a new service, a new production process, application or organizational structure which is introduced to a market or used in production to create economic value"*

When compared to the MEPIN definition, it is evident that the definition in the white paper avoids the ambiguity associated with the interpretation of the degree of change necessary. Furthermore, the aspect of creation of value is included. Additionally, the definition is formulated to fit both private and public sector innovation policy, which makes it possible for comparison

between the sectors. It could be a problem to evaluate the economic aspect of the definition in the public sector, as public organizations produce outputs that are, contrary to the private sector, not sold in markets. Hence, there are no market prices after which these services or products can be evaluated (Klein et al., 2013; Delfgaauw and Dur, 2008).

Furthermore, as a measure to increase the local municipalities in Norway's innovative abilities, the Ministry of Local Government and Modernization published a strategy for innovation in local government in 2013. The strategy used the previously mentioned white paper definition, but simplified it further in order to make it fit better to the public sector:

*"Innovation is the process of developing new ideas and realizing them so they can give added value for the society"*

In an attempt to further simplify the term, the Ministry of Local Government and Modernization (2013: 10- 11) coined the short version 'new and utilized'.

This definition signals the importance of the implementation aspect of innovation and the innovation process. Thus, the strategy explicitly states that in order to be recognized as an innovation it must be implemented and/or used. This definition is simplified and specialized to fit the public sector, as "value for society" instead of "economic value". The issue with the new governmental definition of innovation is threefold. First, with a simplified definition the scope is broad and encompassing. Second, the definition does not address the issues related to the MEPIN report; the degree of change necessary for innovations. Third, with several definitions of innovation issued by the Norwegian government there is a potential for confusion among both practitioners and academics. This could further result in misinterpretations, imprecision, and misleading communication within and between public organizations.

Halvorsen, Hauknes, Miles, and Røste (2005: 5-6) further presents three labels for innovation in the public sector, which were also used in the PUBLIN project; (1) Incremental and radical innovations, (2) top-down and bottom-up innovations, (3) Needs-led and efficiency-led innovations.

These insights on defining innovation are interesting when concerned with change and reforms in the public sector. Reforms of the public sector are active and deliberate attempts from political or administrative actors to modify structural or cultural features in an organization (Christensen, Egeberg, Larsen, Lægreid, and Roness, 2010). Not all reforms lead to change, and at the same time it should be stressed that not all change in public organizations are results of, or initiated by, reforms. Reforms can be examples of top-down initiatives, while incremental innovations can be initiated from the bottom-up (Christensen et al., 2010). Windrum (2008) suggests that top-down innovations tend to aim at increased efficiency in existing services through changes in governance frameworks and regulations. On the other side, bottom-up innovations are often more focused on developing new services or expanding the quality of supplied services (Windrum, 2008). The media has tended to report on top-down initiated innovations, where politicians are normally the champions advocating the innovation (Windrum, 2008). Another interesting point is when innovating through top-down initiatives the customers are the higher political actors, and not the citizens these orders serve (Pott and Kastelle, 2010).

## 3.2 Design Thinking

Design Thinking is an approach to creative problem solving that has been more and more recognized as valuable human-centred innovation (Plattner et al. 2009; d.school 2010a; Kelley and Kelley 2013). It has been viewed as a methodology, culture and philosophy. Common for all views is that Design Thinking is a successful and thrilling practice that gives deep understanding of innovation processes. Prior to Design Thinking, innovation curricula consisted of concepts such as creative thinking, visual thinking and ambidextrous thinking (von Thienen et al. 2016a). Design Thinking education provides students with methodologies for creative work, but a primary goal is still to reach mindsets that aid creativity. A creative solution is defined as something tangible that is novel and useful, satisfying a human need and forwardly oriented in time (Thienen et al. 2017).

### 3.2.1 Creative mindsets

Creative mindsets are researched in various ways, Abraham Maslow compared highly creative and rather rigid people, Carl Rogers described creativity as an attribute of healthy humans that

would allow people to realize their potential and Dana Farnsworth elaborated on emotional prerequisites of creativity (Thienen et al. 2017). John E. Arnold, one of the pioneers in the field and responsible for the first teachings in creative thinking builds on Guilford's factor-analytical studies of creative mindsets. The four Guilford factors are *problem sensitivity*, *fluency*, *flexibility* and *originality*. These factors have made their way into almost all literature on creative thinking, imagination and innovation and are mental attributes essential to be creative regardless of occupation. They are also an inherited potential of each individual, and combined with certain emotional attributes make up the personality of the innovator (Creative Engineering, 96). Arnold adopts these factors and adds three emotion-centred variables: *Daringness, drive* and *confidence*.

*Problem sensitivity* is defined as being aware that a problem exists, Rogers and Mooney speak of this as "openness to experience", it may just be a feeling or hunch before it is defined by investigation and study (CE, p. 80). Arnold describes this as someone with a "deep spirit of inquiry, of questioning" who seeks to "improve the things he sees" (CE, p. 63). In addition to being aware and noticing the problem, a problem sensitive person also develops the interest and intention to follow up on a hunch, ready to invest time and effort (Thienen et al. 2017). Furthermore, problem sensitivity is further defined as abilities of framing, defining and communicating problems in ways that aid creative solutions. Arnold states this as the ability of describing problems in clear and fruitful terms, after being aware of the problem: "Problem statements may limit or free the imagination of the solver. They may precondition his thinking along such narrow and rigid lines that very desirable solutions are precluded." (CE, p. 80). In other words, problem framing opens, closes, and structures solution spaces (Thienen et al. 2017), a good statement of a problem should "Craft Clarity: Produce a coherent vision out of messy problems. Frame it in a way to inspire others and to fuel ideation" (d.school 2010b, p.0).

*Fluency* is defined as the number of ideas that a person produces per unit time. Fluency is also very affected by the problem framing, a fair assumption is general or loosely constrained problem statements increase fluency; narrow or highly constrained problem statements reduce fluency. And disregarding practical limitations when generating ideas increases fluency (Thienen et al. 2017).

*Flexibility* refers to the number of meta-options a person considers per unit time. Meta-options include categories, points of view, approaches, solutions, work pace (Thienen et al. 2017). An example is the usage of a red brick, as there may be many ideas of usage in construction, flexibility is the ability to consider other categories such as a doorstop, bookend or pigment for paint (CE, p. 85). Flexibility is the opposite of rigidity (Thienen et al. 2017).

The last Guilford factor, *originality*, is the unusualness of ideas.

As mentioned, Arnold adds three more variables which focus on motivational and emotional aspects, as being an innovator requires these attributes to overcome inevitable obstacles, resistance and challenges. These variables are boldness in the face of risk, *daringness*, enthusiasm for problem solving, *drive*, and believing in oneself and one's vision, *confidence* (Thienen et al. 2017). The definition of *daringness* is the willingness of a person to challenge the status quo and risk the untried. These risks are often social, as creating involves destroying (CE, p. 87), when one finds a new solution, the old one needs to go and change must be accepted.

*Drive* refers to the emotional energy and enthusiasm with which a person pursues her creative project, specifically when facing hardships (Thienen et al. 2017). Arnold emphasises that innovators simply love to solve problems. Studies on motivation, initiative etc. says the same, as a painter loves to paint, an inventor loves problem solving (CE, p. 87).

The last factor Arnold adds, *creative confidence*, refers to positive beliefs held by a person about her own innovation capacities and the value of her creative project (Thienen et al. 2017). Confidence, intuition or faith in one's own cause is a prime requisite to innovation as there are so many ways in which a good idea can be destroyed or made impotent (Thienen et al. 2017).

## 3.2.2 Thinking modes

Arnold continues to build on Guilford's analyzes and lays out three modes of thinking: Analytical, judicial and synthetic. Analytical thinking detects the features and structures of an entity (Thienen et al. 2017); "Analyzing is the taking things apart in the search for truth and

recognizable relationships" (CE, p. 129). Judicial thinking compares two or more entities and often ascribes value, judicial thinking and evaluation are used synonymously. Judicial thinking can't be made independent of analysis. Synthetic thinking combines two or more entities into something new (Thienen et al. 2017), it is "the bringing together of two objects or concepts for the purpose of making a new combination or whole" (CE, p. 66). Creative thinking combines analytical, judicial, and synthetic thinking in regulated ways. Creative thinking is not a thinking mode itself, but a combination and balance of the thinking modes (Thienen et al. 2017). This includes regulating each thinking mode at will, for example in the idea generation phase, fluency is facilitated by the absence of simultaneously judicial thinking or inhibited by its presence (Thienen et al. 2017). Thus, evaluation must be restrained temporarily while one is thinking up ideas or hypotheses (CE, p. 84), and when the solution space has been saturated, judicial thinking is essential.


### 3.2.3 Problem types

Closely related to the thinking modes, Arnold lays out three basic types of problems: Analytical, judicial and synthetic (Thienen et al. 2017). Furthermore, to distinguish between different problem types, he introduces other criteria: (a) The number of concepts that need to be considered in problem and solution statements next to (b) the number of correct answers. Analytical problems are characterized by precise problem and solution statements that use only a small number of concepts and they have only one correct answer. Examples of this are typical mathematical and logical problems. Judicial problems (a) are characterized by complex problem and solution statements that require intricately refined concepts and (b) they have more than one correct answer (Thienen et al. 2017). Many answers can be defended as right, and answers that were considered right once can be turned down later on (Thienen et al. 2017). Examples are decisions and judgements made in court and beauty contests. Synthetic problems (a) are characterized by an open spectrum of concepts that can be invoked for problem and solution statements and (b) an infinite variety of possible solutions from bad to good (Thienen et al. 2017).

### 3.2.4 Creativity blocks

Creativity blocks refer to factors that antagonize creative activity (Thienen et al. 2017). Arnold categorizes the blocks for creativity in three: Perceptual, cultural and emotional blocks. These blocks range from short-term or rather specific blocks, such as limited knowledge in the respective field, to more general, stable and often personality-related blocks, such as seeking to be a "well-adapted" member of the community who never deviates from common practices (Thienen et al. 2017). Perceptual blocks antagonize the understanding of problem and solution spaces by making information unavailable or distorting it (Thienen et al. 2017). Failure to use all of the senses in observing, difficulty in narrowing the problem too much (paying little or no attention to the environment), difficulty in seeing remote relationships etc. (CE, p. 91-92). Cultural blocks refer to social influences that antagonize the progress or flexibility of creative activity (Thienen et al. 2017). A person falls victim to a cultural block when she allows herself to be driven by a "desire to conform to an accepted pattern" (CE, p. 92) and thus limits her own flexibility. Emotional blocks are emotions that limit the person's ability to develop and/or exploit her creative potential (Thienen et al. 2017). The emotional blocks are by far the largest grouping, and they include all our fears (CE, p. 89). An example of emotional blocks are the fear of making a mistake or making a fool of yourself, an over-motivation to succeed quickly, a lack of drive in carrying the problem through to completion and test or having difficulty in rejecting a workable solution and searching for a better one (CE, p. 92).

### 3.2.5 The creative process

Arnold states that the creative process is unique and universal, so to a considerable extent domain-general. A key element in Arnold's understanding of creative activity is that it is a process of problem solving (Thienen et al. 2017). If a person is being creative or not depends mostly on the process that is followed (CE, p. 71f). Thus the definition of the creative process is a process of problem solving in which the creative agent seeks a novel solution to better satisfy basic human needs - capitalizing on a creative mindset and balancing all three thinking modes along the way (Thienen et al. 2017). Arnold emphasises mindset modes rather than sequential process steps in his creative approach, "Question, Observe, Associate, and Predict" (CE, p. 117). Even the process and search for aids to problem solving is a creative task. There is not a

definitive answer to how the process should be, and it will vary by domain, problem and person (Thienen et al. 2017).

## 3.2.6 Creativity approaches

Arnold classifies creativity approaches in order to analyze the different forms of creative activity and highlight the differences and similarities of the processes that he considers important (Thienen et al. 2017). Arnold expects incremental or disruptive change depending on the chosen approach. The assumption is that there are two types of creativity approaches, *organized* and *inspired*, and the combinations hereof. Organized creativity approaches follow a step-by-step rationale. Within this approach, Arnold mentions the *Empirical* or *Trial-and-Error Approach* and the *Rational Approach*. The empirical approach consists mainly of an endless number of trial-and-error experiments (p. 73), the approach is also frequently called the Edisonian approach, as Edison's search for incandescent filaments is a great example of persistent trial and error. On the other hand, the rational approach is focused on careful thought, both in statement of the problem and the hypotheses which are to be tested later.

Inspired creativity approaches build on intuition, fantasy or other loosely controlled psychological processes; they are characterized by relaxed ties to that which is considered possible, advisable or state of the art in the domain of creative work (Thienen et al. 2017). Here Arnold distinguishes between the *Big Dream Approach* and the *Flash-of-Genius* or *Insight-Based Approach*. The *Big Dream Approach* is carried out by asking yourself the biggest question you possibly can [...], and then expending every possible effort to answer this big question (CE, p. 76). The *Flash-of-Genius* is about insightful behaviour, despite its name, it's a learnable process; "The best way to court insight is to thoroughly immerse yourself in your problem, to have a clear understanding of the nature of the problem, all its data and all its limitations [...]. After periods of unproductive hard work, it is then suggested that you forget the problem completely. [...] Suddenly, when you least expect it, a day, a week, or a month later, an answer will pop into your mind. Why and how no one knows, but this is the flash of genius." (CE, p. 76).

Arnold further attributes the different effects of the two types of creativity approaches: Organized creativity approaches bring about incremental change, while inspired creativity approaches bring about disruptive change (Thienen et al. 2017). Arnold's categories of organized versus inspired approaches is to some extent similar to Maslow's distinction between secondary creativity (where disciplined rule-following yields gradual progress) versus primary creativity (where unconscious, unconventional thinking yields disruptive breakthroughs) (Thienen et al. 2017). Finally, the combined creativity approaches use elements from the organized and the inspired approach. Design Thinking combines inspired and organized creativity approaches systematically and comprehensively. A strict emphasis on the "user need" as the focal point of attention throughout the whole project continuously provides purpose and orientation. Insights are also a key element in Design Thinking (Thienen et al. 2017).

Design Thinking is a methodology for problem solving, which consists of observation and thinking. The details in how this observation and thinking is done is discussed here, which thinking modes, problem types and what attributes which lay the foundation of this process.

## 3.3 Exploration vs Exploitation

The terms exploration and exploitation and its interplay has become a common way of analyzing technological innovation, organisational design, adaptation, learning, survival and competitive advantage since the pioneering article by March in 1991. There is still some discussion among scholars about the definitions and their relationship, but there is a consensus that exploration refers to learning and innovation, while a consensus is lacking if exploitation refers only to use of past knowledge or if it includes the pursuit and acquisition of new knowledge (Gupta et al., 2006).

Baum, Li and Usher (2000:768) suggested that "exploitation refers to learning gained via local search, experiential refinement, and selection and reuse of existing routines". According to Benner and Tushman (2002:679), "Exploitative innovations involve improvements in existing components and build on the existing technological trajectory, whereas exploratory innovation involves a shift to a different technological trajectory", He and Wong (2004:483) supports this by saying something similar as exploitative innovation as "technological innovation activities aimed

at improving existing product-market domains" and exploratory innovation as "technological innovation aimed at entering new product-market domains". Central and common for both here are learning, improvement and acquisition of new knowledge, while the difference is from where this is happening, along the same trajectory or a new one.

Regarding the discussion about the use of past knowledge, other studies treat all activities associated with learning and innovation as exploration and activities using past knowledge as exploitation. Vermeulen and Barkema (2001:459) formulates this as exploration is the "search for new knowledge" and exploitation is the "ongoing use of a firm's knowledge base". Gupta et al. (2006) conclusion builds on March's logic, that all activity includes some learning, even when past knowledge is used and the organisation tries to replicate past actions, it accumulates experience and learns. March (1991:85) noted "the essence of exploitation is the refinement and extension of existing competencies, technologies, and paradigms… The essence of exploration is experimentation with new alternatives". Therefore, it is more logical to differentiate between exploration and exploitation by the type or amount of learning, rather than its presence or absence. Furthermore, the unit of analysis needs to be carefully specified when defining exploration or exploitation. The definition may be different for an individual and the organisation at a more macro level. An activity which may be explorative for an individual, for example an engineer searching and experimenting new ways to produce a product, may be exploited by the organisation for profit along the same trajectories.

## 3.3.1 Interplay

Regarding its interplay, three interesting issues arise. First, orthogonality versus continuity. This posts the question whether they are two ends of a continuum or two different and orthogonal aspects of organisational behaviour. How an organisation pursues both exploration and exploitation depends if it is viewed as two competing or complementary aspects, and the balance of resources dedicated to each. Another issue is ambidexterity versus punctuated equilibrium, where ambidexterity means a synchronous pursuit of both methods, while punctuated equilibrium means a more temporal pursuit cycling through periods of exploration or exploitation. The literature on this gives no answer of which is preferable. The last issue is about duality versus specialization in one of the methods. March's (1991) argues for the need of a

balance between the two, as well as the literature nearly has a consensus that organisations must learn to excel at both.

### 3.3.1.1 Continuity versus orthogonality

March (1991) argued that both are fundamentally incompatible, even though they are essential for long-run adaptation. The arguments March (1991, 1996, 2006) used was first and foremost that they compete for scarce organisational resources. Second, both exploration and exploitation are self-reinforcing, and third, the mindsets and organisational routines are radically different. Quoting March (1996:280) "Exploiting interesting ideas often thrives on commitment more than thoughtfulness, narrowness more than breadth, cohesiveness more than openness". Thus, Gupta et al. (2006) argues that logic dictates that exploration and exploitation are to be viewed as two ends of a continuum. There are some exceptions, where the resources are not scarce for instance. The assumption of the first argument then falls away, thus the scarcer the resources needed to pursue both, the more likely that they are mutually exclusive. There have been several recent studies that examined simultaneous exploration and exploitation, orthogonal in other words, where the activities have been in multiple domains. This shows that the answer of continuity or orthogonality depends on the level of analysis. Within a single domain, i.e. an individual or a subsystem, the two will generally be mutually exclusive. On the other hand, across different and loosely coupled domains, i.e. individuals or subsystems, exploration and exploitation will generally be orthogonal, meaning that high levels of one may coexist with high levels of the other in different domains.

### 3.3.1.2 Ambidexterity versus punctuated equilibrium

The question if one should aim for both exploration and exploitation in a firm or one of them, the literature is pretty clear that there is a need for both. Quoting March (1991:71), "Adaptive systems that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of the benefits. They exhibit too many undeveloped new ideas and too little distinctive competence. Conversely, systems that engage in exploitation to the exclusion of exploration are likely to find themselves trapped in suboptimal stable equilibria". How a balance of effort between the two is achieved is however unclear in the literature, whether an organisation should focus on ambidexterity or punctuated equilibrium,

temporal cycling with periods of each one or a fine simultaneous balance. An important question is if they are equal substitutes or if each mechanism is a function of environmental and organisational context. If one looks at a single domain, as in an individual, subsystem or a tightly coupled system, exploration and exploitation are mutually exclusive and ambidexterity is not productive at all, so a punctuated equilibrium should be the aim. On the other hand, when analyzing multiple, loosely connected domains, exploration and exploitation are orthogonal, thus ambidexterity is possible and may be preferable, for example by exploring in one unit and exploiting in another. A balance between exploration and exploitation, whether it is by ambidexterity or punctuated equilibrium, may be easier to achieve at an organisational level than an individual or subsystem level (Gupta et al., 2006).

### 3.3.1.3 Duality versus specialization

Even though there is a wide agreement in the literature that a dual balance between exploration and exploitation is needed, under certain circumstances, a specialization in one or the other will be logical. That is, when the logic of a single subsystem is expanded to a whole organisation, and its complementary system would be another organisation which it could achieve ambidexterity with (Benner & Tushman, 2003). In that way, an organisation could specialize in either exploration or exploitation, given that the complementary organisation specializes in the other one, and they control mutual resources. The organisation focusing on exploitation would constantly receive new ideas from the one focusing on exploration, and will be able to just have a stable operational culture to focus on exploiting new ideas, in contrast to the dynamic domain of the exploring organisation. Finally, the market relation between the two organisations needs to be sufficient and stable, such that each one gets compensated adequately for their contribution. Both publications of March (1991) and Benner and Tushman (2003) argue that under well-specified conditions, specialization rather than duality might be entirely viable (Gupta et al., 2006).

There is a wide consensus that one should strive for a mutual balance between exploration and exploitation, it is rather how this balance is achieved which is discussed. This intricate balance will be explored in the empirical findings, whether it is achieved by ambidexterity or punctuated equilibrium and if there is duality or specialization within the firm.

# 4. Research method

This chapter presents and argues for qualitative research for this study and describes how the primary and secondary data has been acquired through literature review and case study interviews. Finally, the end of the chapter reflects on the research method involving limitations of the study and ethical considerations.

## 4.1 Qualitative research

The goal of this research was to find out where ideas come from in the Norwegian public hospital for mental health and how they are established into a project. Qualitative research is a suitable choice (Yin, 2014) since the study is focusing on *how* this happens in depth and detail instead of a quantitative measure of how much this happens. This choice of research method provides the study more insightful data and will make it able to fulfill the purpose of study and answer the research questions.

Qualitative research has an open approach where research questions, data acquisition and analysis are a process which happens as the researcher learns more about the topic. Many would agree that the creative nature of qualitative research is one of its key strengths (Pratt, 2009). The qualitative research takes the perspectives and interpretations of participants as starting points (Flick, 2015). The participants are typically interview objects, which is one of the more common methods in qualitative research, in addition to focus groups or just observation. When doing qualitative research there are especially two pitfalls to avoid: (1) lack of balance between theory and data and (2) making qualitative research appear quantitative. Examples of this are telling about data, but not showing it or showing too much data and not interpreting it (Pratt, 2009).

There are both pros and cons with qualitative research. The researcher is doing personal interviews, thus he or she gets close to the data sources which often gives good and nuanced data, but it may also be biased and uncritical data. The questions asked in the interviews are more open ended, in contrast to quantitative interviews with options for answering. Using only

interviews for data acquisition may not give enough diversity in sources and decrease the validity of the research. The research should therefore include other sources of data (Yin, 2014), so available documents, papers or journals have also been used to gather secondary data.

## 4.2 Data acquisition

Secondary data from the literature was first gathered in order to serve as a fundamental framework when gathering the primary data from interviews. The secondary data contains theoretical literature, already presented in the theoretical framework chapter. In addition, earlier theses and reports from the local academic environment have been valuable data. The researcher has also studied government issued papers and reports in order to get an understanding of the contextual framework of Norwegian public innovation.

### 4.2.1 Literature review

The snowball method has been utilized to search the literature, in addition to papers received from the supervisor on theoretical literature. The literature on public innovation, specifically in mental health, is scarce, but earlier reports and theses have supplemented the secondary data. Simply searching for "public innovation" was too vague, so search words as "mental health innovation", "public mental health", "public innovation in mental health" have been used as well. After the study became more specific and clear, literature on Exploration vs Exploitation and Design Thinking have been received from the supervisor. Google Scholar has mainly been the source for finding literature, but there have also been occasional visits to NTNU's database, Oria. Finally, a master thesis about pilot projects in eldercare has been read, and another about public innovation among managers, both from NTNU's School of Entrepreneurship.

### 4.2.2 Case study interviews

Interviews are one of the most crucial tools to obtain case study evidence (Yin, 2014), this gives a close look at the phenomena studied in addition to insight which is hard to achieve without actually talking to the ones involved in the process. Semi-structured interviews were conducted,

as it provides increased flexibility and focus in understanding the interviewee's perspectives of events, patterns and behaviours (Bryman, 2008). This gave room for pursuing interesting or unclear topics with follow-up questions.

The participants of the study were informed that the interview would be recorded for later study and that the material would be confidential. Another benefit with recording was that the researcher's focus was freed from taking notes, thus the attention can be on listening and asking good follow-up questions. The researcher was careful not to ask leading and closed questions as open questions open up for personal reflection (Flick, 2015).

The interview objects for the case studies were recruited through the division for mental health care at the hospital St. Olavs. Three of them belonged to Nidaros DPC, while the fourth one, "Early assessment" was at Tiller DPC. The participants were one researcher, specialist and two managers. The participants except the advisor were working on different projects, but the managers were involved in each other's projects. In addition, an interview with an advisor from the division for mental health care was conducted.

The researcher was interviewed in December 2019, while the three other cases were interviewed in January 2020, and the advisor was interviewed in April 2020. All of the interviews were conducted physically at the participants' locations, except with the advisor in April, this was on Skype due to the Covid-19 situation. The interview consisted of the following five questions:

1. What is the project's idea and when did it start?
2. Where did the idea come from (management, research, user needs etc.)?
3. How was it decided that the idea should be further developed?
4. What was the next step after it was decided that the idea should be developed?
5. What barriers occurred during this process?

Each question had follow-up questions for elaboration and details. The interviews lasted about 30-40 minutes. The researcher were careful to have an open mindset and no prior assumptions or perspectives that may have colored the interviews. The data is presented in the next chapter, Empirical findings, with transparency in order to preserve reliability (Jabosen, 2015).

## 4.3 Reflections on the method

The cases have been sampling units and too small in number to serve as a sample to represent any larger population (Yin, 2014). As there has been limited time and capacity, it would not be possible to map all the actors in the domain. On the other hand, it may not be necessary to interview all existing cases in order to gain an understanding of the domain. Interviewing specific projects gave the researcher a detailed and in-depth view of how each case has come to development. When it comes to the interview setting, a potential downside is if the informant has given the answers he or she thinks the researcher wants to hear (Yin, 2014).

Interviewing can also have a low quality if the asked questions does not reveal useful or enough data, the study is dependent on the informants being able to clearly recall and reflect on past actions and the history of the project's origin. The questions have therefore been iterated and tested with a pilot interview, before the main interviews, in addition to giving sufficient time during the interview to remember. Even though, one of the interviews, case "Early assessment", did not give any valuable information due to the interviewee was not involved in the key process and decision making in the conception of the project.

Four very relevant cases have been studied by interviewing a person that has been involved in the early phase of the project, their description ensures the validity of the data (Jaobsen, 2015). The cases have varied between polyclinics and the persons involved have had different roles, which have given data from different perspectives. A potential improvement would have been to interview several different roles on the same project and more cases. The researcher could also have dug further into finding the right persons with key roles of starting up "Early assessment", but felt that the total case data acquired was sufficient.

The analysis of the empirical findings have been done through the glasses of Design Thinking and Exploration vs. Exploitation, especially Design Thinking for their origin and Exploration vs. Exploitation for their strategy of innovation.

## 4.3.2 Limitations

There are several limitations in the empirical data of the study. First and foremost, the data could be more varied from different angles of the same project. Higher management, specialists, funding institutions and other involved ones in the same project could be interviewed. This would give data which are much more nuanced, in addition to quality checking the already acquired data. Secondly, there could be more quantity in cases. A thesis with the same subject but with a quantitative research method would complement this thesis well, since this study has researched *how* the ideas are born and become innovations with the barriers on the way, but it would also be interesting to see the proportion of how many cases that are developed this way.

Another limitation in the empirical data is the missing study of failed ideas. It would be as interesting to see how failed ideas were born and eventually disregarded. Finally, study of only one hospital is also a limitation, as this doesn't necessarily represent innovation processes in other places.

## 4.3.1 Ethical considerations

The researcher has tried his best to behave honestly and be transparent in terms of sources, references and prior research. The participants have been asked to give permission to record the interview and use it for reviewing the data afterwards. The researcher made sure that the participants were aware that their shared data would be treated confidentially, which means that the participants in the study can require that the data collected from them are kept and stored in a safe way, and that it's deleted after the research process is finished (Thagaard, 2003). Another important ethical aspect was the researcher's role. There is a common assumption in society that the public does not innovate or do things inefficiently, this was important to put aside while doing this research. The researcher has learned that it is rather that the innovations are not as visible as the commercial ones, but there is also some truth in this perspective. When asked about how ideas are born and treated, there was not always a clear answer or knowledge about it. The researcher could feel a bit offensive digging in this subject, as he was trying to find details around why and how the situation was so.

# 5. Empirical findings

This chapter will present the case data found mainly from the interviews, but also related material, such as assignments about two of the cases, short-term polyclinic and Center for eTherapy, written by one of the interviewees. In addition, the findings from an interview with an advisor from the division of mental health care will be presented.

## Case 1: Blue light reducal

The interviewee was a researcher working with sleep and circadian rhythms at NTNU Department of Mental Health and St. Olavs University Hospital, division of mental health care. The researcher's main focus is on clinical sleep medicine and interventions that act on the circadian system in mental disorders.

One of these interventions for insomnia patients is to reduce the blue frequencies from white light, such that the orange and red light remains. The reason for reducing the blue frequencies is because blue light keeps one alert and awake, while the more relaxing and soothing red colors allow the production of the sleep hormone melatonin to begin and ultimately better sleep quality.

The idea came from research in collaboration with a senior doctor who has been working with the same technology. Reducing blue light for better sleep has been known for a while, the interviewee informed that an idea presented in a paper could take 10-20 years before it is implemented. The idea needs to have validation, funding and then dissemination if successful, which is a demanding and long process. The dissemination is what requires the most resources and time among the mentioned phases.

*"Innovation from research is a slow and demanding process."*

Reducing blue light has been marketed by the commercial market for years, but it was not until it was accepted by the research community and an opportunity to implement it had come along

in Trondheim - the planning of a new section for patients being treated at the hospital, that the idea became a project.

The project will be installed at the same time as the new building is starting its construction in 2020. The researcher knew the ones responsible for planning, and the effect for reducing blue light was already well known and documented, so the decision to implement this technology for the managers was straightforward.

*"The responsible for planning the new building is a close colleague of mine, so it was inevitable for me to inform him that this was an obvious opportunity."*


## Case 2: Short-term polyclinic

The interviewee was a section leader and psychological specialist at Nidaros DPC, she was the "founder" or main driver for starting the short-term polyclinic. There was also an additional interview with another section leader and psychological specialist at Nidaros DPC which is currently managing the polyclinic.

The short-term polyclinic consists of a limited amount of consultations for anxiety and depression patients with less complex problems, only 10 treatments are done before the program is done. The treatment is based on cognitive behavioral therapy and metacognitive therapy, these are evident methods and are suitable for short treatments.

The project started May 2016 and had its origin from several psychological specialists that were in regular touch with patients. An observation was that a shorter treatment could also prevent younger patients from building an identity around being mentally ill and attaching themselves to a therapist, in addition to providing the right amount of treatment. This was the foundation for the idea, while cutting down the long queues and providing quick help for those who would need it was also a strong driver.

A dialogue was formed among the specialists and thereafter with management, three other section leaders were involved in the process to build it further. The idea of a short-term

polyclinic was convincing as it had its roots from first-hand observation and research. When it was decided to work on the project, a downstream and upstream process were then simultaneously initiated. A lot of energy was put into sharing the ownership of the idea, to create enthusiasm in the team.

*"This was supposed to be our project."*

The section leader was working on getting fundings and presenting the project to the director for the hospital, the challenge was to disconfirm the belief that using money in this way was wrong. The interviewee was met with skepticism and criticism that e.g. this was just a clinic for the "easy" cases etc.

*"I had to work to elaborate and clarify the criticism of using resources in this way, such that it could be answered in a rational way."*

When the project got funding, a big barrier was gone. This enabled the short-term polyclinic to be established with their own budget and not use resources from another service in the same section. The next challenge was to recruit the right people, including ambassadors, this required a lot of patience and took about half a year. The project started with 4, 6 and then 8 employees that had a common vision and belief in the idea. In addition, the right patients had to be assessed, which was new learning. The first year had good results, but then another challenge came along.

*"Keeping the enthusiasm after the first year is the challenge."*

A new leader was also to be chosen after the first year to keep running the project. The challenge was to sustain a team that was enthusiastic about the idea and felt as much ownership of it as the initial team. This is a major challenge for new projects in the health sector, as there are regular shifts in positions for doctors and specialists at the hospital. This made it challenging to have new specialists accept a new way of treatment, but has been successful because of the results of the program earlier among good leadership.

# Case 3: Center for eTherapy

The interviewees for this project were the same as for the short-term polyclinic, both were involved in the origin of Center for eTherapy as well.

The Center for eTherapy runs therapist-guided Internet therapy for adults with panic disorder, depression and social phobia through the "eMeistring" (eMastery) program. The program is available both for referrals from a general practitioner or specialist health service and personal contact without referrals. It is a 14 week module-based therapy, guided by a therapeut.

The project sprung out from a visit to Bergen and Bergen Hospital Trust in 2016 where convincing results of online therapy were observed. E-therapy was inspired by Karolinska University Hospital in Sweden and started in Bergen in 2012 and has also been researched at NTNU. The e-therapy has both practical and theoretical evidence of good results and was thus appealing to implement in Trondheim as well.

*"It was about relations" (about how this project originated).*

A cooperation with the hospital in Bergen was initiated to develop the service in Trondheim as well, but the project was dependent on getting fundings from external sources to be realized. One of the section leaders applied for funds from Central Norway Regional Health Authority and St. Olavs hospital and got 1 million kroner in total. The Center for eTherapy was project-based until it became its own section in 2017, the first patient was treated in 2018.

*"The e-therapy was much more a finished package than the short-term polyclinic, but there were still challenges to find the right people and create enthusiasm."*

A barrier is that they are hospitants at Bergen and don't have their own technical platform, so some challenges have been establishing a good contract with Bergen Hospital Trust, ownership of services and communication with service-providers. The hospital in Bergen has been transfering limited experience and knowledge, such that the process has taken longer than expected.

# Case 4: Early assessment

The interviewee was a specialist and had been working with management in order to develop the project.

Early assessment of patients was a national agenda to ease pressure from the main queues. It was implemented around 2012, the team in Trondheim started around 2017. The idea came from a national agenda, inspired by a similar policy in Copenhagen and London. The goal was that patients with unknown conditions should be assessed within 2 weeks, as a measure to decrease the long queues for treatment.

In addition to these four cases, there was an interview with an advisor at the division of mental health care at St. Olavs hospital. This interview focused on a more broad perspective of the public innovation process. Since the interviewee is not the driver of any specific project, but rather familiar and involved with several projects, he has more quantitative experience and broader knowledge of the innovation process.

The interviewee informed that there is no systematic or standardized procedure of innovation at the hospital, the division's administration is mainly focused on economy and operations. However, the experience is that most ideas come from the clinics by contact with people and research. The ideas are generally developed locally within the departments after they are conceived. There is not as much innovation from the government, but rather financial support. "Early assessment" is one of the few cases that comes top-down.

*"It should absolutely be a place where ideas could be gathered, assessed and advised here"*

In terms of funding, there is no standardisation or central authority within the hospital to provide this. Projects from the hospital can apply for funds from Innovation Norway, Central Norway Regional Health Authority or other research funds.

# 6. Analysis

This chapter analyzes the empirical findings first according to the research question, then each case is analyzed in light of the theory, Design Thinking and Exploration vs Exploitation.

## Case 1: Blue light reducal

The idea of reducing blue light in order to have patients fall asleep easier was already known from research, but was first available to implement when the polyclinic was going to expand with another building. This required researchers to be responsible and observe the opportunity when it came along and alert the management that an innovation was available that would offer better treatment. A perceptual creativity block would not have allowed this to happen, which is one of the creativity blocks, along with cultural and emotional blocks (Thienen et al. 2017). The solution was such an obvious idea, that there were no obstacles in terms of emotional blocks with hesitation or cultural blocks, since it has been acknowledged as an effective method. So even though there was no problem with the building to begin with, there is still room for creative mindsets and innovation.

The problem was from the researcher's field, insomnia, or sleeping disorders. The costs of removing the installed lights and replacing them with new blue reducal ones would be too expensive, so the researcher was waiting for an opportunity to implement this technology. There was no process of Design Thinking in this case, but it was rather an initial explorative mode of research, searching for and learning new knowledge. Thereafter, when the new building is going to be constructed, the new technology will be exploited using the researchers' and organisation's knowledge base.

The interplay of exploration and exploitation here are depending on the specific unit of analysis. If we look at the whole, the two are not mutually exclusive, but rather orthogonal, as the researchers are exploring simultaneously as the management is exploiting (Gupta et al., 2006). As the activities are happening simultaneously, they are ambidextrous. It is easier to balance these activities with ambidexterity at an organisational level than an individual or subsystem,

where one would prefer striving for a punctuated equilibrium (Gupta et al., 2006). Finally, analyzing the whole organisation, it is clearly dual in it's Exploration vs Exploitation approach. If the hospital would be focusing only on one activity, and being specialized in for example exploiting, it would require another organisation to do the other for a balance (Benner & Tushman, 2003).

The barriers for this project were two sided, on the one hand was the economical part to replace the existing lights, on the other hand it was a lack of opportunities, since there was no place to install new lights. When the news of the construction of a new institution came, it was important that the researcher acted and contacted the right people. One of his close colleagues is fortunately among those responsible for the building. There was little to no resistance regarding the technology, since it was already well known.

## Case 2: Short-term polyclinic

There has been some variation in the origin of all the four projects studied. The projects stem from research, national policy, excursion and observation, but only the short-term polyclinic, even though it was not deliberate, has utilized the principles of Design Thinking, namely problem solving by observation. The short-term polyclinic stemmed from an observation by specialists that there was an opportunity to have shorter treatment for some patients. Those patients were young and could have sufficient treatment in a limited amount of sessions, about 10. In addition the patients wouldn't be able to attach themselves too much to a therapist and build an identity around being a mentally ill person.

It is implicit that there must have been some creative mindsets in play; First, problem sensitivity (CE, p. 80) that the pressure from the queues for treatment could be relieved and patients that don't need long-term treatment would actually be able and perhaps get more benefits by having shorter consultation. Moreover, a creative mindset requires fluency, flexibility and originality (Thienen et al. 2017), which are the four Guilford factors that lay the foundation for such an idea outside of the traditional ways of treatment. The specialists must have had fluency to generate several ideas, to think outside the standard of undetermined amount of treatment and originality of something new. Finally, the three emotional attributes John E. Arnold adds: drive, daringness

and confidence, have been required by the specialists in order to push the short-term polyclinic through the barriers of status quo in addition to being convincing for the management.

In addition to the creative mindsets, there must have been some *creative thinking*. Creative thinking combines analytical, judicial, and synthetic thinking in regulated ways (Thienen et al. 2017). These thinking modes must have been present in order to arrive at an original and realistic idea within the capabilities and resources of the hospital. There was no systematic Design Thinking process, but since the team has arrived at a valuable idea, it is reasonable to assume that the team has been through the different modes spontaneously. Regarding problem types, one could say that long queues is an analytical problem and that the idea originated from that. The capacity was less than the demand, which has a very logical answer: The capacity must either increase, by more therapists and/or faster treatments or the queues must be shorter, the latter one is harder to control. In this case, faster treatments was the solution to the problem and the origin of the short-term polyclinic.

Creative blocks are also inevitable in such a process, John E. Arnold categorizes the blocks for creativity in three: Perceptual, cultural and emotional blocks. As a short-term polyclinic is something new, a cultural block will always occur, as it is a change of the conformed status quo. The problem was that the project wouldn't get any funding from the leading management as long as this cultural block was present. This may have been the biggest barrier in this case. The interviewee confirmed this by her own experience, but it didn't seem that the interviewee experienced a perceptual block, as she observed the environment clearly in order to synthesize an idea with the available resources and patient's needs. Neither was it any apparent emotional blocks present, as the interviewee seemed very confident and driven that this was a right and proper solution to the long queues. With such conviction and confidence, the interviewee and her colleagues were able to convince the leading management as well.

## Case 3: Center for eTherapy

E-therapy is an online consultation program with follow up by a specialist. It was inspired by another instance, but this was from a visit to Bergen and not a top-down policy. A trip to Bergen's DPC showed promising and effective results for patients using e-therapy, which gave

the idea to try e-therapy in Trondheim. This activity was clearly an exploring one, but what is interesting is that the activities are not orthogonal in this case, since the same exploring unit is also exploiting and executing the idea too (Gupta et al., 2006). This is a case where the two are mutually exclusive and on each end of a continuum, which makes it impossible to pursue the two activities simultaneously for the unit. The team has strived for a punctuated equilibrium in the project, but had challenges with exploring, because the cooperation with their partners has been throttling the development process. A slow learning process has made the dependent exploiting slow as well, which has been the main barrier for this project. Another barrier was funding here too, which is the case for most new services from bottom-up. Anyhow, this case was more convincing as it was already known from another instance and had good results. E-therapy is a good example of a project where duality in both exploration and exploitation were necessary.

## Case 4: Early assessment

Unfortunately, there is not enough empirical data on this subject to do a thorough analysis. The reason is because this is a special case since the idea came from top-down, a national agenda inspired by foreign countries. The process involves several participants from top management, and empirical data have unfortunately not been gathered from them.

It is unknown where and how the idea started, but Design Thinking may have been used in the process, since it is unknown how complete the idea was and how much adjustment it needed when it arrived in Norway. Furthermore, it is also unknown if the idea was actively explored or encouraged by an international relationship. At least, Norway could be viewed as an organisation and said to be exploiting the idea.

## Cross case analysis

The first research question asks how ideas originate in the public mental health sector, this includes finding out where they come from. The empirical findings show that all of the ideas come from bottom-up except the Early assessment, which is a top-down policy from a national

agenda. Regarding the bottom-up projects, all of them come from different places, Blue light reducal came from research, while the Short-term polyclinic was from internal observation and discussion among colleagues, and the last, Center for eTherapy, was from a cooperation with an external source, a visit to the polyclinics in Bergen. How these ideas originated are a more complex question, which require us to define the constraints of where they are seen as originating. The natural scope of this is inside St. Olavs, while e.g. the blue light reducal originated from international research groups, we will say here that they originated from the researcher at St. Olavs, and while eTherapy wasn't invented in Bergen, it originated from there for St. Olavs.

How the ideas actually came to development for St. Olavs are a combination of different effects. Some were from routine activities such as visiting other DPC's and research. The short-term polyclinic originated by observation and discussion, a methodology which is coherent to Design Thinking, even though it wasn't deliberately used. There is unfortunately not enough empirical data about the early assessment to say in detail how it originated, more than that it was from a political agenda.

The second research question is about the barriers each of the new services has encountered. The short-term polyclinic and Center for eTherapy was going through an application process for funding at the hospital. These projects were among others dependent on the quality of the application conveying the value of the innovations to get permission and funding. When the projects were granted funding, they were capable of gathering a team and developing it with specialists. The blue light reducal was discovered through research, while how the idea developed into a project was more about relationships, since the researcher was capable of informing his close colleague which was partly responsible for the opportunity to implement new lights in the construction of a new clinic. The barriers here are more the opportunity and resources. It was too expensive to replace the existing lights, and it is not often that a new institution is constructed, so until then the technology would be inactive.

A red line here is that there was no systematic and intended innovation, but rather an ad hoc approach where the pressure from long queues and waiting time sparks observation and needed creativity and also initiates a required action. This analysis is also confirmed by the interview with the advisor from the division for mental health care. This is much closer to a

*Flash-of-Genius* or *Insight-Based* approach that Arnold describes, rather than a *Trial-and-Error Approach* (Thienen et al. 2017)*.* Considering the constrained resources for the organisation, it makes sense that this is the approach. This is a barrier itself to new services, in which there is so much pressure from customers that there is no room to experiment and spend time brainstorming new ideas, which could paradoxically help easing the pressure.

On the other hand, there are many benefits from the strong relation both within the organisation and external partnerships. Several innovations seem to have their origin from communication, partnerships and sharing. This is rather the strength of a public institution, it is a trusted actor and will have ease in forming bonds with others. This is important to keep in mind while the innovations are searched for and developed.

# 7. Conclusion

This chapter presents the insights from the empirical findings and analysis, followed by what implications these insights can have for the mental health sector at St. Olavs hospital. Then the thesis concludes with suggestions for further research.

## 7.1 Origin and barriers of new services

There seems to be an intricate balance between exploration and exploitation in the studied cases. Two out of four ideas were explored from external sources, one was explored internally and the fourth was received from a political agenda. All of the ideas were mutually exploited by extending existing competencies and technologies in alternative ways. Exploiting external known solutions like eTherapy is a good choice, since a lot of research, results and solutions are already available and ready to be implemented.

The nature of the early phase of the cases includes many uncertainties and barriers. The ideas have to be driven by a responsible, which is not given who. There was no assigned position of innovation, as the managers, researchers or specialists have to take initiative to either speak up or take the idea in their own hands. There is no specific place with a dedicated team to approach when one has a new solution or improvement that can assist with innovation related things such as survey if the idea has been patented, previously tested or implemented by a partner for knowledge and technology transfer, provide available resources, knowledge and funding opportunities, help with an execution plan and do business and innovation specific tasks etc. Instead, it is normally communicated bottom-up to a manager which has to prioritize this among other tasks and responsibilities. The researcher believes this is related to the issue with incentive of innovation in the public service institutions.

It seems that there is a missing piece in the area of research, an incentive of innovation. It is somewhat contradictory in the health sector that one actually doesn't want retention on customers, this is contrary to business logic. The power of public institutions is that they are not economically driven by the profit of customers and can thus defy this business logic, however it

also removes the biggest incentive of innovation. The power of commercial businesses is that they are intensely profit driven in a competitive market and thus required to constantly recruit high end talent and innovate new solutions for the customer's needs. Meanwhile, in the researched DPCs, patients are viewed as pressure instead of a factor of success, as it may have been in a commercial business. The researchers' impression is that a business perspective in the public mental health services would gain the care as well.

The theoretical contribution of this study is not substantial, but it has served the purpose of the study by giving the public mental health sector attention and explored the innovation dynamics from within to a certain degree. The research has covered an innovation process without deliberate methods, the innovations originate from ad hoc circumstances and are a reaction to strong pressure. Design Thinking is not consciously present and should be considered an opportunity, at least opening a space for brainstorming new solutions and ways of working would be fundamental for further innovation. Which problem solving method is chosen is not the most important thing at this stage, as long as there is one.

## 7.2 Implications

An idea for helping innovation in the mental health sector is to have a "sandbox", which is programmer lingo for a *Trial-and-Error Approach* (Thienen et al. 2017). It is a place where one could try out new things and play without risk and a fear of failure, like a child in a sandbox. Why this doesn't exist is probably no mystery, there is a lot of pressure on the therapists and no room for extra innovation with experimentation. The paradox is that this may decrease the queues, and thus decrease the pressure and need for innovation in the midst of the storm, which could lessen stress and give more quality innovations. This place could be a space for Design Thinking, where colleagues share experiences and observations and brainstorm.

The researcher also suggests that there should be a deliberate team for assisting new ideas in public mental health services with in-depth knowledge of innovation. As mentioned in the previous subchapter, there is a need for assistance in innovation related tasks such as survey if the idea has been patented, previously tested or implemented by a partner for knowledge and technology transfer, provide available resources, knowledge and funding opportunities, help

with an execution plan and do business and innovation specific tasks etc. This is mostly about someone having an overview of the market and calling the decisions if an idea should be exploited or further explored.

## 7.3 Further research

There are many approaches to take for a valuable study in the same direction. The researcher suggests further research at the same hospital should either consist of other innovation cases, including failed ones, with data from different perspectives or a quantitative study. An isolated study of public innovation with empirical data from top management would also be a study of interest. If the study would be done at another hospital, researching either of the suggested approaches or the same as this study would be relevant and interesting.

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