



Public user innovation: Exploring the support mechanisms and user roles in a public organisation

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3 **Purpose:** This article expands literature on user innovation by exploring the mechanisms that
4 support user innovations in the context of a public organisation. Research has hitherto documented
5 support mechanisms for user innovation in producer companies, where users contribute in early or
6 temporary innovation phases as external non-employees or lead-users engaged by the producer.
7 Complementarily, this paper explores a lesser known area of support mechanisms, those that
8 support internal user innovations in a public sector setting.
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12 **Design/methodology/approach:** Employing a qualitative study of a Norwegian public hospital at
13 the interface between users (personnel and patients) and organisational support (facilitators who
14 orchestrate user innovations), this article analyses in-house user innovation based on observations,
15 text documentation and interviews over a four year period.
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18 **Findings:** In this public hospital, *holistic* organisational facilitation of ‘public user innovators’
19 formed the key support mechanism built on ‘people’ (facilitating co-creation), ‘process’
20 (facilitating ideas, project realisation and implementation) and ‘coordination’ (facilitating systems
21 and communication). The findings show that public and producer organisational mechanisms both
22 resemble and differ in many respects, as illustrated by the framework developed to describe these
23 characteristics, such as that producers insource users, while the public organisation outsources
24 production.
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28 **Originality/value:** The originality of the article lies in the identification and description of ‘public
29 user innovation’ (PUI), a new term developed from this study of a public organisation in contrast
30 to the dominant literature on producer companies. This article contributes new insight by
31 differentiating the *roles* of user innovators and the *mechanisms* that support such innovations. New
32 implications are drawn from the public side of organisational support in user innovation research.
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1. Introduction

User innovations are created as users generate solutions to their own needs when no satisfactory arrangements exist (von Hippel 2005). Based on personal utility and high commercial potential, user innovations are drivers of significant economic and societal value (e.g., Agarwal and Shah 2014; Gambardella, Raasch, and von Hippel 2017; Hienerth, von Hippel, and Jensen 2014; Yu 2021). To increase the benefit from users as innovation sources, companies develop support mechanisms (Keinz, Hienerth, and Lettl 2012); consequently, it is important to study the support side of user innovations within organisations. Organisational support mechanisms for user innovations are undertaken by the company to promote and advance these in-house innovations (Nambisan, Agarwal, and Tanniru 1999). User innovations are typically new products, processes or services that are developed by user organisations, individual end-users or user communities rather than by suppliers (producers or manufacturers). Such innovations take place in two different settings: (i) in relation to or within producer firms (e.g., Hienerth, Keinz, and Lettl 2011; Koch and Artmayr 2019) or (ii) in non-production settings, such as medical treatments developed by users (e.g., Bjørkquist, Ramsdal, and Ramsdal 2015; Habicht, Oliveira, and Shcherbatiuk 2013; Schiavone 2020).

The supply of users into manufacturing organisations has led to a growing body of research on user innovation management within producer firms (Roy and Sarkar 2016), focusing on involvement, knowledge creation and adoption decisions (Di Gangi and Wasko 2009; Keinz, et al. 2012; Nambisan, et al. 1999). Further, research on user innovation in organisations documents two main types of users who support innovation through their relationships to producer firms: external users and internal users. External users (externals) mainly contribute during early or temporary phases of production as non-employees (e.g., Jeppesen and Frederiksen 2006; Lettl, Herstatt, and

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3 Gemuenden 2006a; Di Gangi and Wasko 2009). Internal users (internals) are typically hired into
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5 producer firms (e.g., Schweisfurth and Raasch 2015; Wadell, Sandström, Björk and Magnusson
6
7 2013) due to their specific lead user capacities (Brem, Bilgram, and Gutstein 2018). Thus, users
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9 are typically insourced to producers on a short-term or even permanent basis due to their valuable
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11 user knowledge, benefitting commercial product development (e.g., Wadell et al. 2013; Chatterji
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13 and Fabrizio 2014; Schweisfurth and Herstatt 2016).
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17 From these insightful studies, however, we know little about the support mechanisms of
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19 user innovation in organisational settings beyond producers, that is, in non-production settings.
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21 Therefore, investigation of user innovation from a public sector context is called for. Hence, this
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23 study seeks to contribute to the field of user innovation, by focusing on user innovators and the
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25 support side, but from the context of a public sector hospital. User innovation research has to some
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27 extent focused on healthcare, but mainly also from the private sector. Due to the many differences
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29 between private and public organizations it would be interesting to investigate potential similarities
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31 and differences when it comes to the facilitation of user innovation.
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35 Compared to private companies, public organizations differ in many respects. For example,
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37 the value foundation and incentives are different with societal factors over economic earnings,
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39 serving citizens over company owners and shifting political steering of community resources.
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41 Public organizations, owned and funded by the government, have a designated function to provide
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43 services deemed essential for society and its citizen users. Over the last decades, public
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45 organizations have become more accountable to principals (i.e. citizens) and agents (i.e. managers)
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47 due to the forces of globalization and information technology (Demircioglu and Audretsch 2017).
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49 They need to be efficient (i.e. pressure to save money and reduce costs), effective (i.e. improve
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51 quality of services), and satisfy users. Therefore, creating a workplace encouraging innovation is
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3 crucial. Research has shown that public organizations can be innovative and that public sector
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5 employees innovate (Osborne and Brown 2013), particularly when they are able to experiment and
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7 are motivated to make improvements (Demircioglu and Audretsch 2017). Public organizations
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9 are of great importance to a well-functioning society as they provide vital services in today's
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11 society, including education, key utilities and infrastructure (e.g. Fuglsang and Rønning 2014).
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13 Healthcare is another key example. Public hospitals, clinics, and healthcare locations help to
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15 provide essential health treatments, medications, surgeries, and other services for the general
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17 public (Björkquist et al. 2015). A hospital is an institution built, staffed and equipped for the
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19 diagnosis of disease and for treatment with specialized health science of the sick and injured, and
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21 for their housing during this process. The modern hospital often also serves as a centre for research
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23 and teaching. In Norway, there are four regional health co-operations of hospitals with a primary
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25 aim to provide citizens with specialized treatment and high-quality health services equal to all, in
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27 addition to research, training and education services to patients and relatives
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29 (www.government.no).
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38 The relevance of studying user innovation in non-production settings is also particularly
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40 apposite given the large propagation of user innovations across a variety of contexts in professional
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42 and private lives, such as parental care, physical exercise, leisure activities, and healthcare. These
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44 innovations typically emerge through people who engage in grassroots processes, which were
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46 recently highlighted as important precursors to social welfare (von Hippel 2017). Such user
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48 innovations originate in everyday activities far from traditional producer work, and thus lack
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50 sophisticated knowledge about product development and manufacturing. According to Di Gangi
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52 and Wasko (2009, 311), researchers are accustomed to studying user innovation communities as
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3 *external* to an organisation. Thus, they argue, research must examine organisations that reposition
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5 user innovation communities as *internal* innovation resources, where the organisation can capture
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7 user innovations directly. To mitigate this gap, this study sets out to illuminate the support side of
8
9 user innovation inside organisations, investigating this phenomenon in the non-producer context
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11 of a public hospital organisation. Here, the user innovators are patients and in-house professionals
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13 employed by the organisation. They benefit from the utility value of using their corporately-
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15 developed innovations, where the commercial aspect is less present. The studied user innovators
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17 are labelled ‘public user innovators’. Inspired by research on employee-driven innovation (Opland
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19 et al. 2022), these ‘public user innovators’ are further defined as “regular professionals and patients
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21 who engage in the idea initiation, test and development, and implementation of new products,
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23 services or processes originating from their user needs for their own use and benefit in medical
24
25 and health treatment recovery”.

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31 This paper aims to extend the support side of user innovation by examining how and
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33 through which mechanisms user innovation activities are supported in a public organisation.
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35 Mechanisms are understood as structural arrangements, e.g. groups, procedures and systems that
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37 are specifically undertaken and put in place to enhance an organisation’s user innovations
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39 (Nambisan et al. 1999). This question is explored via an in-depth qualitative study of a large
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41 university hospital on rehabilitation in Norway. As a leading national provider of public
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43 rehabilitation services, the hospital has developed systematic organisational support to handle user
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45 ideas, projects and infrastructure across all units. The present study focuses on the organisational
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47 support at the interface between the users (hospital personnel and patients) and their facilitators
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49 (individuals who orchestrate user innovation activities), identifying the support mechanisms that
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51 substantially enhance the entire cycle of user innovation from initiation to realisation and
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3 implementation, with facilitation as the key success factor. Comparisons further reveal that this
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5 public organisation, resembles as well as differs from a producer company in distinct ways. Its
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7 distinguishing features include (i) organisational characteristics regarding role, scope and benefit
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9 and (ii) support mechanisms regarding facilitation of users (people), public user innovation
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11 activities (process) and infrastructure and communication (coordination). This paper suggests that,
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13 together, these features seem to differentiate the support mechanisms for user innovation in public
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15 organisations from those in producer organisations.
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20 This research contributes to user innovation literature in three ways. First, the study
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22 identifies and demarcates a *different setting and associated user role*, i.e. ‘public user innovators’
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24 in a public organisation, from the context of user-producer relationships hitherto described in the
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26 user innovation literature. Second, the findings reveal the *mechanisms that support user*
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28 *innovations in a public organisation* and how they differ from previous studies of user innovations
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30 in producer firms. Third, and taken together, a *framework* of public user innovation is developed
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32 that extends, differentiates and refines our understanding of the support side of organisational user
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34 innovations.
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39 Section 2 reviews the literature on user innovation and support mechanisms in producer
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41 firms. Then, Section 3 presents the research method and highlights the empirical analysis and
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43 findings. Next, Section 4 describes the framework and recommends contributions from the support
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45 side of public user innovation. Novel theoretical and practical implications are drawn from these
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47 findings, which result in entirely new paths for future research, as described in Section 5.
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50 **2. Literature on user innovation and support mechanisms**

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54 This section on user innovation in producer settings provides a theoretical context and basis for
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56 later comparisons to the non-producer setting in this paper. To begin, user innovations within
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3 organisations by external and internal user innovators are reviewed to clarify and differentiate their
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5 roles. Then, the support mechanisms for user innovation, which have hitherto applied to producer
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7 settings, are reviewed.
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10 11 **2.1. The role of external user innovators**

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14 The contributions of users as external sources of innovation and value creation in producer firms
15
16 have long been acknowledged (e.g., Baldwin and von Hippel 2011). The role of external user
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18 innovators is typically to help production companies, of which they are not employed, strengthen
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20 innovation in their product development processes to refine products or open new commercial
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22 markets that are well aligned to consumer preferences (Bogers, Afuah and Bastien 2010). More
23
24 specifically, *external user innovators* are defined as non-employees who contribute their user ideas,
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26 experience or knowledge to an organisation to create something new that suits commercial users.
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31 Considerable research has been devoted to the many external user contributions in
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33 manufacturing and their temporary relationships with producers. DeMonaco, Ali, and Hippel
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35 (2006) found that, in off-label drug therapy, external clinicians play a major role as lead users, i.e.
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37 users at the forefront of spotting new market needs (Jeppesen and Laursen 2009; Kaiser and
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39 Müller-Seitz 2008; von Hippel 1986). Lettl, Herstatt, and Gemuenden (2006a) documented users'
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41 contributions to radical innovations in medical technology by addressing how manufacturing firms
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43 benefit from innovative users in the early phases of innovation projects. In a similar vein, Chatterji
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45 and Fabrizio (2014) argued that inventive collaborations with users improve corporate product
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47 innovation, particularly in the technology areas of radical innovations. Chatterji and Fabrizio (2012)
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49 also showed that user physicians influence manufacturing firms' medical inventions by providing
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51 a broader set of follow-on technologies, which occur earlier in the product life cycle than other
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3 corporate inventions. Hienerth, Keinz, and Lettl (2011) reported the introduction of user-centric
4 business models in large, established companies, such as LEGO, IBM and Coloplast, which have
5 integrated users into their business processes. Jeppesen and Frederiksen (2006) assessed user
6 contributions as significant to firm-hosted user communities in software manufacturing, and Lettl,
7 Herstatt, and Gemuenden (2006b) documented producer firms that learn from interacting with
8 users. Common to these studies is the observation that users contribute as external resources to the
9 producer company on a specific part, on a short-term basis, and, typically, in the early phases of
10 the innovation process.
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22 **2.2. *The role of internal user innovators***

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25 In comparison, less research has been conducted on user innovation by company employees.
26 Studies have shown how user innovators become manufacturers (Block et al. 2016) or self-
27 employed user entrepreneurs (Haefliger et al. 2010; Shah and Tripsas 2007). Recently, studies
28 have started to document contributions by users who are being hired into manufacturing companies.
29 Wadell et al. (2013) showed that incorporating user physicians and nurses as employees enhanced
30 product development in a large medical technology company. Schweisfurth and Raasch (2015)
31 found that embedded lead users contributed to corporate product innovation in mountaineering
32 equipment. They defined embedded users as firm employees who were also users of the firm's
33 products, being both integrated into the firm and the use context outside of the firm (Schweisfurth
34 and Herstatt 2014). Typically, these users are hired into specific business units to strengthen
35 product development in corporate production. The users go from being external users to becoming
36 internal user innovators based on their lead user capacities. Thus, *internal user innovators* are
37 employees who contribute their ideas, experience, or knowledge to create something new that
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3 better suits their use in their own organisation and in the commercial domain (Schweisfurth and
4 Raasch 2015) or that suits sheer commercial purposes (Wadell et al. 2013).
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8 **2.3. *Support mechanisms in producer settings***

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11 The insourcing of users has further led to a focus on user innovation management within producer
12 organisations (Roy and Sarkar 2016). To benefit from users as innovation sources in producer
13 settings, Keinz et al. (2012) argued that organisations must be designed for user innovations. They
14 proposed four design strategies (search, harvesting, cooperation and ecosystem) for utilising
15 external users in the commercial activities of producer firms. Search and harvesting refer to
16 companies that only occasionally engage in user innovation, such as through limited events or
17 contests. Cooperation involves utilising relatively few external contributors on a continuous basis;
18 appointed persons are responsible for relationship management with lead users and external
19 experts, as well as the support of project-to-project learning. The ecosystem focuses on
20 collaboration with many companies or external individuals, such as through toolkits or user
21 communities. People, work processes and coordination systems are central to each strategy.
22 Nambisan et al. (1999) highlighted knowledge acquisition and conversion as important
23 organisational mechanisms for managers to enhance external users' propensity to innovate at early
24 idea stages of information technology. Di Gangi and Wasko (2009) emphasised the importance of
25 adoption decisions regarding new product ideas from external online user communities. Hirsch,
26 Stockstrom, and Lüthje (2014) found that user innovation in techniques triggers medical product
27 innovation by external user innovators and manufacturers. They argued that techniques can be
28 diffused only with the involvement of diffusion agents and their interpersonal interaction and joint
29 performance with possible adopters. Wadell et al. (2013) showed that internal users play important
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3 roles as user representatives, idea promoters, networkers and change agents, whom managers need
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5 to nurture and balance against other groups and knowledge domains.
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8 From the literature, it is clear that user innovation in organisations focuses on user-producer
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10 relationships in manufacturing environments of various kinds (see Table 1 for an overview).
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12 Further, in the many studies of medical products, physicians and nurses have been shown to be
13
14 very capable of innovating (e.g. Lettl et al. 2006a). However, the core operation of a public hospital
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16 is very different from that of product manufacturing. Thus, support mechanisms might be even
17
18 more critical to the realisation of product innovations in non-producer organisations because they
19
20 lack manufacturing competence and equipment. Therefore, it is of interest to explore how
21
22 organisations, beyond producer settings, conduct and support internal user innovation activities.
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24 From these premises, this study sets out to empirically explore the support mechanisms for user
25
26 innovation in a public organisation. The following section addresses the methods for this
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28 investigation.
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37 **3. Research method and design** 38 39

40 When investigating a ‘how’ question on a contemporary phenomenon within its real-world context
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42 and for which scant prior knowledge exists, a qualitative, exploratory case study approach (Yin
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44 2014; Eisenhardt 1989) is suitable. The case method (Burawoy 1991) brings together detailed and
45
46 descriptive empirical data to integrate and extend theory. In the present study, a single case study
47
48 design was applied to provide an in-depth understanding of user innovation support mechanisms.
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52 Organisations in the medical equipment sector, including private hospitals, have
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54 represented cases within user innovation research (e.g., see Lettl et al. 2006a). The studied public
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3 hospital was selected for its extraordinary user innovation experience as part of its core activities
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5 (medical rehabilitation treatment and services to severely injured hospital patients), based on its
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7 decades of best practice in continuous developmental work and, more recently, its extensive efforts
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10 to support user innovations throughout the entire organisation.
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13 The present study focused on the interface between the support side (facilitators) and the
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15 users within the hospital to understand the ongoing efforts and activities that promote user
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17 innovations within the organisation. Facilitation refers to activities that make tasks easier for others
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19 (users) by enabling individuals, groups and organisations to collaborate, work more effectively
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21 and achieve synergy to accomplish a common organisational goal (Kaner 2014). This study
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23 presents the hospital organisation, followed by the gathered data and the data analysis.
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28 **3.1. The hospital organisation**

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31 Globally, this hospital is among the leading specialists in physical medicine and multidisciplinary
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33 rehabilitation, treating around 6,000 patients annually via medical teams tailored to each patient's
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35 special needs. Its vision is to advance from a hospital with some innovation activities to become
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37 'an innovative hospital' (Strategy document 2015–2018). It wants to work to 'create tomorrow's
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39 solutions to improve treatment and rehabilitation service by, with, and for its users.' To make
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41 innovation part of daily hospital operations, it relies on recent policy demands to employ even
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43 more focused, systematic and measurable efforts. In 2011, the hospital established an Innovation
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45 Unit to facilitate innovation activities, including orchestrating an extended Innovation Team; the
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47 unit comprises the innovation head and an advisor and reports to the Chief Executive Officer
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49 (CEO). The Innovation Team consists of nine key representatives (healthcare professionals) from
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51 the main departments of the hospital (the Clinic, Cooperation and Research Departments) that
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3 innovate in strategic priority areas. The team's role 'is to be a catalyst, orchestrator and advisor for
4 innovation activity, both internally and toward external institutions, partners and business—
5 nationally and internationally' (Strategy document 2015–2018). A user patient representative, who
6 is a regular team member, ensures the rights and interests of the patients and their relatives are
7 being addressed. Occasionally, the CEO participates. Another team member is an external
8 innovation advisor from a large, national innovation network that comprises all types of actors in
9 the medical technology area, including large companies, start-ups, research institutions, funding
10 organisations, science parks, incubators and public institutions.
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22 The hospital plans to undertake, and will be measured on, innovations in service delivery
23 quality, efficiency and effectiveness (e.g., Norwegian Ministry of Health 2009, 2011). These
24 innovations require new ways of thinking, working and organising beyond traditional intra-
25 organisational hospital operations. The hospital is an early mover in this landscape, with the entire
26 country's population as potential users. Complex user needs, combined with accessible technology
27 and a rapidly growing medical technology industry, have created opportunities for user innovations
28 across the entire course of preventive efforts, diagnosis, treatment and recovery. User personnel
29 include doctors, nurses, ergonomists, physiotherapists, speech therapists and psychologists, as well
30 as other professionals. The user patients have severe physical and/or cognitive injuries, such as
31 stroke, amputations, paralysis and trauma. Many patients are permanently injured and need
32 recurrent hospital treatment, individually-adjusted aids and support at home and/or work. User
33 innovations are motivated by the lack of satisfactory aids for these rather marginalised groups to
34 improve their recovery and help them learn to cope and live with the handicaps that permanently
35 restrict their autonomy and quality of life. User personnel and user patients lack the capacity to
36 handle all innovation activities on top of regular hospital work or impairments. Therefore, a key
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3 factor in conducting user innovations is the orchestration and facilitation of the work executed by
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5 internal innovation resources.
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8 **3.2. Data gathering**

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11 As part of a larger research project on innovation (conducted between January 2012 and December
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13 2015), the data in this paper highlight the facilitation of user innovation at the hospital from
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15 January 2014 to December 2015. This period was selected because user innovation activities
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17 increased substantially and assumed more systematic and structured forms due to facilitation at
18
19 this time. The data came from three sources (see Table 2 for an overview).
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24 The first, main data source was the observation of the Innovation Unit, the Innovation Team
25
26 and their efforts to systematically support user innovation activities. Observing the Innovation
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28 Team's meetings, content and actions was particularly important because they stood out as the
29
30 central arenas of and for organisational practice (Jarzabkowski and Seidl 2008), where support
31
32 activities were debated, chosen and evaluated. The observations consisted of listening to what
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34 people expressed through statements, presentations, discussions, concerns and agendas during
35
36 eight team meetings. The meetings were held regularly about every other month, lasting
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38 approximately two to three hours each. All meetings were recorded with the participants' consent
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40 and transcribed verbatim to enhance validity, resulting in a 150-page document. Field notes were
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42 frequently used to record follow-up questions in conversations with informants during pauses,
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44 after meetings or at lunch, all of which enhanced thick descriptions (Geertz 1973) and provided a
45
46 deeper understanding of the team's activities. To enhance anonymity, the quotations recorded in
47
48 this paper refer to the type of actor who made the statement, i.e. facilitator, user personnel or user
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3 The second source of data was a collection of the texts on which participants worked and
4 to which they referred during the team meetings, e.g. minutes, grant applications and assessment
5 procedures. The data also included other written and electronic materials, e.g. websites, archival
6 records, information about external partners or collaborators, national and regional policies and
7 funding sources. This written documentation was used to compare and enrich the information
8 gained from observations and to validate the interpretations of that information (Patton 2015).
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12 The third data source was the observation of other innovation seminars, gatherings and
13 cluster meetings, as well as user innovation projects (from start to finish) (Author 2015). In
14 addition, interviews and informal talks were conducted with facilitators, personnel and patients,
15 and observations were made of their meetings with business companies and other external entities,
16 such as researchers, students, collaborators from other hospitals, municipality healthcare workers
17 and network representatives. These data (gathered throughout the project period) were used to gain
18 a deeper understanding of how user innovations were developed, funded, organised and facilitated,
19 including the progress of support activities. This information helped explain and verify expressions
20 and actions in relation to a much broader understanding of the organisation and its external
21 collaborators, which is suggested to enhance the validity of interpretations (Patton 2015).
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44 **3.3. Data reduction, coding and analysis**

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47 Thematic analysis (Guest, MacQueen, and Namey 2012), a much-used qualitative technique, was
48 conducted to enable a deep understanding of the organisation and allow exploration of themes that
49 emerged from the data, beyond individual experiences (Braun and Clarke 2006; Daly, Kellehear,
50 and Gliksman 1997). The data structure (inspired by Gioia, Corley, and Hamilton 2012) is shown
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3 in Figure 1. The data reduction and coding process followed four phases (Guest et al. 2012). The
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5 *first* phase, coding the data based on informant (and other text) expressions, involved searching
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7 for meaningful patterns that described user innovation support. The coding was guided by
8
9 exploratory questions, such as *what* activities were performed to accomplish the user innovations
10
11 and *who* was doing what. It included questions about *how* activities were done (efforts, means,
12
13 tools, etc.), including how informants discussed and interpreted ongoing activities (in meetings,
14
15 etc.) and *why* it was important to them. These answers resulted in numerous quotations that
16
17 depicted the user innovation activities in the organisation, along with the actors and the processes
18
19 in which they were involved. Sample expressions are provided in the first column of Figure 1.
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24 *Second*, from the quotations, initial themes were generated by assigning codes (names) to
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26 the activity categories (see Figure 1, column 2). Searching for themes among the codes involved
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28 comparing frequencies, identifying theme co-occurrences and displaying relationships between
29
30 the different themes. For instance, an important activity was idea facilitation, which involved
31
32 gathering, validating and approving user ideas. *Third*, these themes were critically reviewed again,
33
34 by double- and triple-checking their rigor and consistency regarding the interpreted meaning that
35
36 led to the designation of the themes and their relations. It became clear that the facilitators' actions
37
38 could be structured into several organisational support mechanisms in which they were involved
39
40 throughout the user innovation process. As a result, five core aggregate dimensions were singled
41
42 out, with various activities pertaining to each (see Figure 1, column 3).
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47 *Fourth*, the aggregated themes reached their final defining and naming phase in the process
48
49 of comparison to the literature (as indicated in Figure 1, column 4). The analysis was iterative
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51 across pertinent literature, themes and dimensions (Guest, MacQueen, and Namey 2012).
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53 Similarities and differences between the emerging dimensions and the existing literature were
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3 carefully compared (Yin 2014) to examine the relevance and effects of the organisational support
4 mechanisms in the hospital. The documented material resulted in the identification and
5 development of overarching characteristics (role, scope and benefit) and support mechanisms
6 (pertinent to people, process and coordination). These characteristics and support mechanisms
7 distinguish public user innovation in a public setting (see Figure 1, column 5) from that of user
8 innovation in a producer company. These distinctions have been depicted in a novel framework
9 (see Table 3). This research is a step toward building theory from case study data (Yin 2014,
10 Eisenhardt 1989). Through expansion and refinement of the previous literature, this study
11 introduces new insight into user innovation and support mechanisms inside organisations.
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28 **4. Support mechanisms for user innovation in a public organisation**

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31 This section presents the mechanisms that support user innovation in a public organisation. The
32 analysis focusses on mechanisms of facilitation that support user innovation in the public hospital,
33 and comparisons are made to producer settings. The nuanced points of differentiation are
34 synthesised into a framework of support mechanisms for user innovations in these two types of
35 contexts.
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43 **4.1. *Facilitation as a key support mechanism in public user innovation***

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46 Organisational facilitation stands out as the main mechanism enabling user innovation in this
47 organisation. Facilitator support was observed to be key to the user innovation accomplishments
48 made by user personnel and user patients. The hospital's annual report showed that, since 2011,
49 user innovation projects have grown significantly; there were 27 completed projects and 25
50 ongoing projects by the end of 2015. At the hospital, the Innovation Unit and the extended
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3 Innovation Team orchestrated these activities together based on user needs. The facilitators defined
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5 their role as follows:

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8 *We are the facilitators. We are not supposed to own or run projects, nor independently*
9
10 *invent or carve out projects. Our job is to ensure that our organisation is able to conduct*
11
12 *and progress useful innovation projects that serve our needs. The requirements coming*
13
14 *from the clinic, the patients and other units steer us (Facilitator).*
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19
20 An important job for the facilitators, was to bring people together and make sure they had
21
22 the opportunity to keep innovation processes running in the organization:

23
24
25 *We have a very systematic approach when it comes to innovation and development. This*
26
27 *involve everybody in the hospital from our patients and medical staff to all our departments*
28
29 *and into the top leader group. We have a top manager who really wants to make innovation*
30
31 *part of our DNA, so to speak. Around the year, we have regular sectional and cross-*
32
33 *sectional collaborations where we meet, interact, discuss and take action to further*
34
35 *enhance our projects, like the one today where we decided, at the team level, how to further*
36
37 *improve the sensor for fall detection, for example. Then we help gather together all the*
38
39 *relevant people, challenge the progress and keep track of the process (Facilitator).*
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45 Also in literature, increased engagement among user employees in innovation activities has
46
47 been shown to be a frequent reason for stronger efforts to organise innovation development on a
48
49 sustainable basis (Keinz et al. 2012). In producer organisations, facilitators are crucial to enhance
50
51 user innovations by designating individuals to mediate between the users, user communities and
52
53 the producer (Nambisan et al. 1999; Keinz et al. 2012). The support in producer settings is typically
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3 restricted to early phases and specific events; in contrast, this hospital facilitates user innovation
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5 throughout the entire organisation to help achieve its goal to become an innovative hospital (e.g.,
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7 Di Gangi and Wasko 2009). Hence, the hospital utilized a comprehensive way of organisational
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9 facilitation, cutting across all parts of the hospital to develop their user innovations.
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12 13 **4.2. People: Facilitating co-creation with the public user innovators**

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15 The organisation further facilitated interaction between its users and various partners and
16
17 communities to develop the user innovations, as addressed in the part below.
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23 While the dual relationship between one type of user and producer is emphasised in many studies
24
25 (e.g., Lettl, et al. 2006a), user innovations at the hospital required the facilitation of a large mix of
26
27 patients, personnel, production firms and public authorities, as one of the user personnel
28
29 exemplified:
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33 *During the projects, the patients are with us all the time, commenting, correcting,*
34
35 *posting wishes and suggesting improvements. They know very well how things must be*
36
37 *to function, and they are so creative in finding solutions to their compound problems.*
38
39 *Simultaneously, we depend on producers and other experts to develop the actual*
40
41 *product (User Personnel).*
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46 In searching for external collaborators, the facilitators considered which relevant functional
47
48 milieus or companies to contact and with whom to partner. They stated, 'This can take some time,
49
50 as we need to be absolutely sure that the project partners make a good match' (Advisor). This was
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52 very important because of the special features of the products they developed.
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3 *Our products are often quite unique and sometimes even one of a kind. They are made to*
4 *fit people with certain and typically highly specific individual needs that must be tailor*
5 *made or exactly adjustable depending on the user (Advisor).*
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11 This means that the products are small scale productions, often in a niche format and
12 typically with a long test and development period of user feedback in order to make the product as
13 useful as possible. User innovators were put in contact with relevant partners for both
14 product/service innovation and production, which included initial phases and prototypes to
15 finished products. The partners included firms (established or start-up), research institutions, other
16 hospitals and healthcare institutions, municipalities, regional health authorities, nursing homes,
17 special patient-interest organisations, innovation networks and other stakeholders. In particular,
18 the users partnered with manufacturers for product development and commercialisation. The
19 combination of specific user knowledge (Shah and Tripsas 2007) and supplementary (producer or
20 other) knowledge is essential for the production of tailored user innovations. That these
21 collaborative relations were systematically matched across organisations and institutions
22 (domestic and international), with the help of specially-assigned internal facilitators with wide
23 networks of contacts, seems different from previous studies. It also seems that these public user
24 innovations with a high degree of individual adjustments require small scale production in contrast
25 to more general products aimed to fit a larger market of users like the ones developed in larger
26 scale producer settings.
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48 In addition, unique combined competence was built in the co-creation processes.
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51 *The thing is that he (the designer) needs to understand my particular needs with the usage*
52 *of this device, otherwise it will not be possible for me to manage it on my own. Due to my*
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3 *complex challenges, which I have spent years to learn to grapple with, it will take*
4 *some time to make others understand how it must work. At the same time, I need to*
5 *understand what features he is able to make, we need to come up with a common*
6 *understanding somehow (User Patient).*
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13 This shows that it can take a long time to learn and develop the right underlying
14 understanding to make such user innovations work. Such competence is not readily available for
15 application, but rather needs to be acquired, typically in close collaborations of user-producer
16 relationships. It is a dual competence developed together between patients and professionals for
17 their common usage and between users and producers in the production process. In contrast,
18 research in producer firms has primarily focused on the incorporation and immediate benefit of
19 the utilisation of external user knowledge (e.g., Wadell et al. 2013).
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30 **4.3. *Process: Facilitation of ideas, project realisation and implementation of public user*** 31 ***innovation*** 32 33

34 The user innovation process consists of idea generation, product development and
35 commercialisation (Tietz et al. 2005). The hospital facilitators supported this process through three
36 stages: idea facilitation, project realisation and implementation. The first stage, idea facilitation,
37 consists of gathering, validating and approving user ideas. To *gather* ideas, the facilitators
38 developed a mail box (idea bank) for users to contribute innovative proposals. Since 2011, over
39 200 ideas from professionals and patients (and, sometimes, from their relatives) have been posted
40 to improve treatment or aid. To illustrate, many patients are at risk for bedsores, which require
41 changing the body's position about four times per hour and can take a year to heal. Since special
42 furniture worked unsatisfactorily, the idea of special textiles to relieve pressure was suggested by
43 medical experts and patients with spinal cord injuries. The requirement was clear from the user
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3 patients: 'Make me something I can wear on travels, and I'm in.' Next, the facilitators *validated*
4 the ideas. For example, when an idea met the novelty, relevance, resource and use-value criteria
5 to patients, employees, relatives and efficiency, one facilitator said, 'Someone has to green light
6 the project,' referring to the *approval* needed from the unit leader for small projects and the top
7 management for large, multi-team projects.
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15 *When we validate, we go through a long list of criteria. Is the idea useful, how will it be*
16 *useful, what are the costs, do we have the competence needed to test and develop the idea*
17 *further, what is the potential time frame to reach a first prototype and from there and to*
18 *production of a potential product? What kind of team do we need, what type of*
19 *collaborators? And so on and so forth. We discuss all these factors very thoroughly and*
20 *weigh the different ideas and potential projects up against each other to review the best*
21 *alternative for the patients regarding use value and costs (Head of Innovation Unit).*
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31 This shows that gathering, validating and approving ideas constitutes an important early-
32 stage mechanism in the facilitation of public user innovation.
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39 At the hospital, once a project was established, the facilitators helped support its realisation,
40 which is the next stage in the process of creating user innovations (Tietz et al. 2005). Informal
41 talks with users revealed strong agreement among project group participants that the facilitators'
42 hands-on assistance was decisive for realising their projects. One user stated, 'Without them [the
43 facilitators], my project would not even get started, simply because I would not know where to
44 find the right people, particularly external expertise, or where to seek funding.' Since user demands
45 are often highly specialised (Luthje et al. 2005), products can be costly to make, and the hospital
46 lacked the necessary finances and in-house resources for production. Therefore, project funding
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3 from various sources was necessary to realise its innovations (Lettl et al. 2006a). Thus, a key
4 competence of the facilitators was applying for the right type of funding and knowing how to
5 develop proposals. User innovators in production settings have attracted external funding from
6 crowdsourcing (Mollick and Nanda 2015) and venture capital (Smith and Shah 2013).
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13 Currently, innovation in healthcare is a priority in Norway, and public monetary resources are
14 available. The project portfolio at the hospital listed financial support from governmental
15 instruments for innovation in the form of industry collaboration (Innovation Norway) and research
16 (the Research Council of Norway) on user-driven, industry-oriented, research-based innovation
17 projects, as well as from other national and regional actors that provide funding. Amid tough
18 competition for external funding from sources like the Research Council of Norway (on university-
19 industry collaboration), different foundations (e.g. Dam) and associations (e.g. the Norwegian
20 association for stroke), the hospital had a high award rate on its grant applications. Its user
21 innovation products were produced together with relevant manufacturers in the latter's factories.
22 For example, such collaboration involved the early phase of a user and a technician who adjusted
23 a digital drawing in order to improve the physical prototype to provide a better end solution for
24 the user, with testing and adjustments made directly to the device in the production facility (see
25 Author XXXX for a previous article on the particular interaction between a patient and a producer).
26 Or it involved e.g. the very last adjustments of the tag of a garment ready for final production. This
27 way, the hospital outsourced the production of its user innovations because it did not have its own
28 equipment for such production. This approach is very different from previous studies where the
29 producer firms handled (user innovation) production in-house (e.g. Schweisfurth and Raasch 2015;
30 Chatterji and Fabrizio 2013; Wadell et al. 2013).
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3 The final stage of the process is commercialisation (Tietz et al. 2005). At the hospital, this
4 meant implementation for use in its own organisation. According to one of the user personnel,
5
6 'The technical equipment we developed is now out in the clinic, in use by the therapist operating
7
8 it and the patient benefiting from it.' This view differs substantially from user innovations in
9
10 producer firms, where the aim is to manufacture for sale to large-scale consumer users (Di Gangi
11
12 and Wasko 2009). At the hospital, the products were small-scale, specifically adjusted for a small
13
14 group or individual, and returned from producers for use in their own organisation. However, some
15
16 products also approached commercialisation, depending on their potential for sale to extended user
17
18 groups. For example, seamless garments for medical treatment also have benefits in the regular
19
20 market for sports clothing. In these projects, the facilitators supported user innovators in their
21
22 commercial activities, such as by helping them apply for funding to develop user manuals (to
23
24 accompany sold products) and supporting them in the certification and regulatory approval process
25
26 by relevant authorities for healthcare aids. Nevertheless, the hospital had little experience with the
27
28 commercialization of its innovations, and moving into this domain posed fundamental questions,
29
30 such as the role of a public hospital in commercial activities and whether a hospital is supposed to
31
32 take products to the market. As a result, a certain percentage of commercial sales were placed into
33
34 a trust fund to help finance new project innovations in the hospital. Research on user
35
36 commercialisation (e.g., Yadav and Goyal 2015; Haefliger, Jäger, and von Krogh 2010; Shah and
37
38 Tripsas 2007) highlights the involvement of users in realising innovations in producer settings or
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40 user entrepreneurs starting their own businesses. However, research has not documented support
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42 efforts from public organisations to facilitate commercial user innovation activity with producers.
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4.4. *Coordination: Facilitating systems and communication for public user innovations*

The hospital facilitators coordinated internal systems and external communication as infrastructure to define routines, make innovation processes more predictable and build an innovation culture. They coordinated with other health institutions and authorities on a new steering and reporting system to administer the increasing number of innovation projects in their database. One concern they noted was balancing routines with flexibility. One of the facilitators said, 'Of importance is doing this without a lot of paperwork. Innovation needs space, and we need to be flexible enough to keep the enthusiasm that has to lie behind any innovation.' Balancing the power between an organisation's need for structure and the user communities' need for autonomy and self-regulation is a challenging managerial issue that is under constant negotiation, as described by Di Gangi and Wasko (2009). Thus, autonomous clusters were developed to function as central hubs for innovation work, holding regular meetings and arrangements for knowledge sharing within the areas of cognition, technology and eHealth, virtual rehabilitation, movement and patient security. According to Nambisan et al. (1999), group learning represents an important organisational mechanism that increases users' propensity to innovate. Benefits from user communities are manifold and are associated with motivation, fun, feedback and learning (e.g., Lakhani and von Hippel 2003; Jeppesen and Frederiksen 2006). A priority for the facilitators was to encourage and professionalise user innovations during work days that were already busy. The innovation head stated, 'We need to get the leaders to involve themselves much more actively and systematically.' After a long process, innovation became part of the hospital's leadership agreements, which define the leaders' work tasks. The establishment of these new systems and work processes are all considered central in the organisational support of user innovations (Keinz et al. 2012).

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3 Another important task was the facilitation of external communication, i.e. connecting and
4
5 maintaining good relations with external individuals and businesses to attract the right people and
6
7 make their user activities known. These important pillars are widely confirmed in other studies of
8
9 user innovation (e.g., Yadav and Goyal 2015; Jeppesen and Laursen 2009; Lettl et al. 2006a). The
10
11 facilitators at the studied hospital maintained close contact with academic institutions and master's
12
13 degree students in developing computer games for physical and mental rehabilitation exercises.
14
15 The hospital also hosted seminars with the medical technology network to present its ideas to a
16
17 large audience of stakeholders with the capacity to help produce user innovations. These
18
19 arrangements spurred a range of projects. Finally, the facilitators used social media to promote
20
21 innovation activities. One indicator that their activities were acknowledged is the growing number
22
23 of requests they received from externals to collaborate based on the hospital's reputation. Such
24
25 external communication is vital to an open innovation environment (Chesbrough, Vanhaverbeke,
26
27 and West 2006). Known search, harvesting and collaboration designs (Keinz et al. 2012) are
28
29 restricted to a few single users or a defined group. Coordination at the studied hospital stretched
30
31 much further, beyond its ecosystem strategy, in terms of coordination with many different users
32
33 and stakeholders from business and the public sector (at the local, regional and state levels). While
34
35 producers typically hire users (e.g., Wadell et al. 2013), the studied hospital built relationships
36
37 with producers for their expertise and willingness to manufacture customised innovations. This
38
39 way of facilitating user innovations differs significantly from integrating users into manufacturing
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41 firms (e.g., Di Gangi and Wasko 2009) or turning user companies into manufacturers (Haefliger,
42
43 Jäger, and von Krogh 2010; Shah and Tripsas 2007). While producers insource external users into
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45 their innovation process, this hospital as a public organisation with internal user employees,
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47 outsourced production to manufacturers.
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3 **4.5. Synthesis of findings: Characteristics of and support mechanisms for public user**
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5 **innovation**
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8 Overall, the present analysis shows that the core support mechanisms used by the studied
9 organisation included:
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14 • Facilitation in various constellations of co-creation of public user innovation. This involved a
15 variety of patients, different types of professionals and producers, as well as other network of
16 relevance to the user innovations including financial sources. This suggests that public user
17 innovation may involve a more comprehensive set of actors than user innovation in the
18 traditional producer settings of e.g. single lead users.
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26 • Facilitation of innovation activities and projects in the public user innovation process. At an
27 overall level, this step wise process of idea generation and product development resembles to
28 a large degree the innovation process in producer companies. However, regarding
29 commercialization it differs as it seems that public user innovation is made and implemented
30 in a more specialized and smaller scale than the typical producer setting which aim for a
31 broader customer and market segment. In addition, it takes time to develop the highly specific
32 and combined competence and understanding necessary to tailor many of the public user
33 innovations due to complex individual requirements.
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41 • Facilitation of infrastructure to efficiently support the public user innovations by means of
42 systems and communication for internal and external collaboration. Coordination wise, while
43 traditional producer firms insource single users into their production, in public user innovation
44 the production is outsourced to external partners for manufacturing of the products.
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3 A high degree of collaboration is a key feature in each of these areas. The facilitation of
4 ideas, projects and implementation/commercialisation, along with the development and
5 maintenance of internal systems and external communication, holistically supported user
6 innovations in this public organisation. The mechanisms supported the entire hospital organisation
7 (all units, managers and employees at different levels, as well as patients) and cut across all the
8 elements that comprised the entire user innovation process (Tietz et al. 2005). Hence, such broad-
9 based facilitation of user innovation is more comprehensive and distinct from supporting the
10 incorporation of lead users' external knowledge into producer companies.
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22 Further, certain characteristics of a public organisation can be drawn from these novel
23 findings at the studied hospital. These distinctive features seem to distinguish what can be termed
24 'public user innovation' as different from user innovation in a producer setting. The central
25 characteristics of user innovation in the literature are typically based on users' roles in production,
26 their benefits and the scope of user innovations (e.g., Bogers et al. 2010). Moreover, the public
27 organisation consists of public user innovators who innovate on highly customised terms, for
28 internal use, and not indirectly for sale to other users or consumers. From these findings, a
29 framework has been developed (see Table 3) that synthesises points of differentiation in the
30 characteristics and mechanisms of support for user innovation in public and producer contexts.
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44 Table 3 near here
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47 **5. Discussion and implications**

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50 This study set out to examine the support mechanisms of user innovations in a public organisation,
51 investigating user innovation beyond that in conventional producer companies. Its contributions
52 to the user innovation literature are discussed in this section. To further carve out similarities and
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3 differences between the two different contexts of user organisations, central findings are compared
4
5 to known research on characteristics and support mechanisms in producer settings. Hence, the
6
7 discussion below is organised into user roles, support mechanisms and distinctive characteristics.
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11 First, the existing literature describes two types of user roles in producer relationships:
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13 external user innovators (e.g., Chatterji and Fabrizio 2014; Lettl et al. 2006a; Jeppesen and
14
15 Frederiksen 2006) and internal (hired) lead user innovators (e.g., Wadell et al. 2013; Schweisfurth
16
17 and Raasch 2015; Schweisfurth and Herstatt 2014). The users in this study, labelled public *user*
18
19 *innovators*, do not fit the first role because they are internals. They also differ from the latter role
20
21 as they are patients and regular employees (employed for their professional competence) as
22
23 opposed to being hired into the organisation because of specific lead user capacities. Grounded in
24
25 daily hospital operations, public user innovators contribute their ideas, experience and knowledge
26
27 to create something new that, through its use within their own organisation, enhances rehabilitation
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29 (and welfare) rather than increases economic profit. These differences highlight that there is
30
31 another important type of user innovator, i.e. public user innovators who are patients and
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33 professionals, in contrast to externals or temporary engaged lead user innovators. Therefore, the
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35 present findings extend and refine previous knowledge of the *roles* of user innovators.
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42 Second, the present findings reveal the *mechanisms* that support user innovations beyond
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44 producer-related settings. The user innovation processes observed at the studied hospital resemble
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46 the process of producer organisations described by Tietz et al. (2005), particularly regarding early
47
48 phase idea generation. Regarding realisation, the studied hospital followed the same overall
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50 features of people, process and coordination as those found in producer organisations; however,
51
52 differences are also evident. For example, organisational facilitation is essential to successfully
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54 generate and accomplish user innovations in public organisations. These findings support previous
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3 claims that organisations need to be designed appropriately to take greater advantage of their user
4 innovations, since the extent of the promotion efforts made by change agents positively influences
5 such innovations (Keinz et al. 2012; Di Gangi and Wasko 2009; Nambisan et al. 1999). At a more
6 detailed level, however, the present study moves beyond single company events, such as contests
7 and toolkits. It also moves beyond the early phases of the innovation process, by showing that
8 organisational orchestration represents an essential element, spanning the entire organisation in a
9 holistic and persistent manner.
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20 A major difference between public and producer organisations is that producers insource
21 (external) users into their production phases, keeping manufacturing in-house. The studied hospital,
22 in contrast, utilized in-house users but outsourced production, since they had to rely on
23 collaboration with producers to manufacture their user-developed products. Furthermore, the
24 hospital implemented user innovations within its own organisation, in contrast to producer
25 organisations, which pursue a path of commercialisation (e.g., Block et al. 2016). Thus,
26 organisational facilitation in a hospital setting might be more comprehensive as it cuts across all
27 parts of the organisation, as well as employs relationship building with various internal and
28 external stakeholders to realise its user innovations. Therefore, a public organisation coordinates
29 a larger ecosystem of diverse actors compared to the more limited coordination of search,
30 harvesting and cooperation, which involves relatively few users in relation to the early phases of
31 idea generation and production (Keinz et al. 2012). From these distinctive features, this study
32 contributes to the literature on user innovation support (Di Gangi and Wasko 2009; Keinz et al.
33 2012; Nambisan et al. 1999), documenting the organisational support of public user innovations
34 in a public organisation and showing how they resemble and differ from the previously
35 documented features of producer organisations.
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3 *Third*, by exploring and comparing different user organisation settings and the role of user
4 innovators, along with their support mechanisms, certain differentiating characteristics have
5 emerged. These characteristics have been developed into a *framework* that extends and refines our
6 understanding of the support side of organisational user innovations. This study points out
7 distinctions of support mechanisms between user innovation in public and producer settings.
8 These elements have not previously been highlighted to further understand the role of
9 organisational support in developing and strengthening in-house user innovations. Fragments of
10 work processes and coordination systems have been addressed by Keinz et al. (2012) regarding
11 design, by Nambisan et al. (1999) regarding managerial action and by Di Gangi and Wasko (2009)
12 regarding decision-making procedures for validation by innovation agents. In this landscape, the
13 present study contributes to user innovation literature by presenting an integrated and more
14 nuanced perspective on support mechanisms inside user organisations.

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17 To conclude, the contributions to user innovation literature are threefold. First, this study
18 highlights another type of in-house user—public user innovators—in a public setting by
19 developing the concept of public user innovation as a new term. Second, the study contributes to
20 the literature on user innovation support by identifying mechanisms of organisational user
21 innovation in a public setting. Third, and overall, this study adds to existing knowledge of user
22 innovation by offering a new concept, ‘public user innovation’, and a new understanding of the
23 support mechanisms for user innovation in a public organisation.

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25
26 Consequently, managers of public and producer organisations should consider these
27 mechanisms, if their aim is to enhance user involvement or boost their own user innovation
28 activities. A holistic approach to support mechanisms seems to improve the mutually beneficial
29 effects for users and organisations, as well as coordination for implementation or

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3 commercialisation. For user innovation facilitators in the public sector, attracting funding and
4 relevant producers for co-production becomes key to finalising innovations, as attracting lead users
5 is important to producer firm management (Lettl et al. 2006a). When it comes to managing the
6 important two-way relationship where public organisations outsource production (while producers
7 insource users), collaboration with producers seems to be most important towards the end of the
8 innovation process. For producers, however, managing communication with, and the involvement
9 of, users is most critical at the early stages of innovation.

20 *Limitations and future research*

23 This study represents another step toward understanding user innovation processes and related
24 support mechanisms inside organisations. Due to the limitations of this single study in the context
25 of one public organisation, further research is needed, since generalisations cannot be made from
26 this study alone. Nevertheless, from the growing democratisation and vast occurrence of user
27 innovations due to grassroots efforts (von Hippel 2005; 2017), this study can generate concepts
28 and principles with relevance to other domains (Gioia et al. 2012) where user innovation support
29 is central. Transferability might apply to other non-producer contexts and to traditional user-
30 producer settings.

42 This initial differentiation of user innovation support beyond the traditional producer
43 company context opens new paths for future research. First, studies that specifically address *public*
44 *settings* or other non-producer organisations are encouraged in order to generate broader
45 contextual insights on users' different contributions inside organisations. A deeper understanding
46 of the outsourcing process of production is also highly relevant. Furthermore, an examination of
47 the implementation of user innovations is needed because implementation for own-use benefit is

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3 likely to be more important than commercialisation in public organisations as economic profit is
4
5 not necessarily the main driver of innovation. Second, further *comparisons between user*
6
7 *innovations in producer and non-producer contexts* are needed to understand the many-faceted
8
9 aspects of the continuously evolving phenomenon of user innovation. This applies, for example,
10
11 to the motivational aspect of why users in different settings innovate (for fun, profit, welfare, etc.).
12
13 Third, it is important to investigate the contributions of user innovation to societal welfare through
14
15 *collaborations between public and private constellations*. This relationship is interesting as public
16
17 organisations typically depart from conventional economic principles by serving dual goals of
18
19 social values balanced with efficiency and cost savings, as mentioned by Baldwin and von Hippel
20
21 (2011). The clear need for research into the institutional underpinnings of user innovation and
22
23 cross-organisational relationships can further promote innovation that centralises users as
24
25 important contributors to value creation and welfare, whether in healthcare or other important
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27 sectors.
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33 34 **References**

- 35
36
37 Agarwal, R., and S. K. Shah. 2014. "Knowledge Sources of Entrepreneurship: Firm Formation
38
39 by Academic, User and Employee Innovators." *Research Policy* 43 (7): 1109–1133.
40
41 Author. 2015.
42
43
44 Baldwin, C., C. Hienerth, and E. von Hippel. 2006. "How User Innovations Become Commercial
45
46 Products: A Theoretical Investigation and a Case Study." *Research Policy* 35 (9): 1291–
47
48 1313.
49
50
51 Baldwin, C., and E. von Hippel. 2011. "Modeling a Paradigm Shift: From Producer Innovation
52
53 to User and Open Collaborative Innovation." *Organization Science* 22 (6): 1399–1417.
54
55
56
57
58
59
60

- 1
2
3 Bjørkquist, C., Ramsdal, H., and K. Ramsdal. 2015. "User Participation and Stakeholder
4 Involvement in Health Care Innovation – Does it Matter?" *European Journal of*
5 *Innovation Management*, 18 (1): 2-18.
6
7
8
9
10 Block, J. H., J. Henkel, T. G. Schweisfurth, and A. Stiegler. 2016. "Commercializing User
11 Innovations by Vertical Diversification: The User-Manufacturer Innovator." *Research*
12 *Policy* 45: 144–259.
13
14
15
16
17 Bogers, M., A. Afuah, and B. Bastien. 2010. "Users as Innovators: A Review, Critique, and
18 Future Research Directions." *Journal of Management* 36 (4): 857–875.
19
20
21
22 Bower, J. D. 1996. "User–Producer Interaction and the Case of Biomedical Innovation." *Journal*
23 *of Industry Studies* 3 (1): 21–34.
24
25
26
27 Braun, V., and V. Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research*
28 *in Psychology* 3 (2): 77–101.
29
30
31
32 Brem, A., V. Bilgram, and A. Gutstein. 2018. "Involving Lead Users in Innovation: A Structured
33 Summary of Research on the Lead User Method." *International Journal of Innovation*
34 *and Technology Management* 15 (3): 1850022-1-1850022-27.
35
36
37
38 Burawoy, M. 1991. *Ethnography Unbound*. Berkeley, CA: University of California Press.
39
40
41
42 Chatterji, A. K., and K. R. Fabrizio. 2014. "Using Users: When does External Knowledge
43 Enhance Corporate Product Innovation?" *Strategic Management Journal* 35: 1427–1445.
44
45
46
47 Chatterji, A. K., and K. Fabrizio. 2012. "How do Product Users Influence Corporate Invention?"
48 *Organization Science* 23: 971–987.
49
50
51
52 Chesbrough, H., W. Vanhaverbeke, and J. West. 2006. *Open Innovation: Researching a New*
53 *Paradigm*. Oxford: Oxford University Press.
54
55
56
57
58
59
60

- 1
2
3 Dahlander, L., and L. Frederiksen. 2012. "The Core and Cosmopolitans: A Relational View of
4 Innovation in User Communities." *Organization Science* 23 (4): 988–1007.
5
6
7
8 Daly, J., A. Kellehear, and M. Gliksman. 1997. *The Public Health Researcher: A
9 Methodological Guide*. Melbourne, Australia: Oxford University Press.
10
11
12 Demircioglu, M. A., and D. B. Audretsch. 2017. Conditions for innovation in public sector
13 organizations. *Research Policy* 46: 1681–1691.
14
15
16
17 DeMonaco, H. J., A. Ali, and E. Hippel. 2006. "The Major Role of Clinicians in the Discovery of
18 Off-label Drug Therapies." *Pharmacotherapy: The Journal of Human Pharmacology and
19 Drug Therapy* 26: 323–332.
20
21
22
23
24 Di Gangi, P. M., and M. Wasko. 2009. "Steal my Idea! Organizational Adoption of User
25 Innovations from a User Innovation Community: A Case Study of Dell IdeaStorm."
26 *Decision Support Systems* 48: 303–312.
27
28
29
30
31 Eisenhardt, K. M. 1989. "Building Theories from Case Study Research." *Academy of
32 Management Review* 14 (4): 532–550.
33
34
35
36 Franke, N., and S. Shah. 2003. "How Communities Support Innovative Activities: An
37 Exploration of Assistance and Sharing among End Users." *Research Policy* 32 (1): 157–
38 178.
39
40
41
42 Fuglsang, L., and R. Rønning. 2014. Introduction: Framing Innovation in Public Service Sectors:
43 A Contextual Approach. In: Fuglsang, L., R. Rønning, and B. Enquist (Eds.). *Framing
44 Innovation in Public Service Sectors*. Routledge. NY, pp. 1-17.
45
46
47
48
49 Gambardella, A., Raasch, C., and E. A. von Hippel. 2017. "The User Innovation Paradigm:
50 Impacts on Markets and Welfare". *Management Science*, 63 (5):1450-1468.
51
52
53
54 Geertz, C. 1973. *The Interpretation of Cultures: Selected Essays*. New York: Basic Books.
55
56
57
58
59
60

- 1
2
3 Gioia, D. A., K. G. Corley, and A. L. Hamilton. 2012. "Seeking Qualitative Rigor in Inductive
4 Research: Notes on the Gioia Methodology." *Organizational Research Methods* 16 (1):
5 15–31.
6
7
8
9
10 Guest, G. S., K. M. MacQueen, and E. E. Namey. 2012. *Applied Thematic Analysis*. Thousand
11 Oaks, CA: Sage.
12
13
14 Habicht, H., P. Oliveira, and V. Shcherbatiuk. 2013. "User Innovators: When Patients Set Out to
15 Help Themselves and End Up Helping Many." *Die Unternehmung* 66 (3): 277–294.
16
17
18
19 Haefliger, S., P. Jäger, and G. von Krogh. 2010. "Under the Radar: Industry Entry by User
20 Entrepreneurs." *Research Policy* 39: 1198–1213.
21
22
23
24 Hienerth, C. 2006. "The Commercialization of User Innovations: The Development of the Rodeo
25 Kayak Industry." *R&D Management* 36 (3): 273–294.
26
27
28
29 Hienerth, C., P. Keinz, and C. Lettl. 2011. "Exploring the Nature and Implementation Process of
30 User-centric Business Models." *Long Range Planning* 44 (5–6): 344–374.
31
32
33
34 Hienerth, C., E. von Hippel, and B. M. Jensen. 2014. "User Community vs. Producer Innovation
35 Development Efficiency: A First Empirical Study." *Research Policy* 43 (1): 190–201.
36
37
38
39 Hinsch, M. E., C. Stockstrom, and C. Lüthje. 2014. "User Innovation in Techniques: A Case
40 Study Analysis in the Field of Medical Devices." *Creativity and Innovation Management*
41 23: 484–494.
42
43
44
45 Hyysalo, S. 2009. "User Innovation and Everyday Practices: Micro-innovation in Sports Industry
46 Development." *R&D Management* 39: 247–258.
47
48
49
50 Jarzabkowski, P., and D. Seidl. 2008. "The Role of Strategy Meetings in the Social Practice of
51 Strategy." *Organization Studies* 29 (11): 1391–1426.
52
53
54
55
56
57
58
59
60

- 1
2
3 Jeppesen, L. B., and L. Frederiksen. 2006. "Why do Users Contribute to Firm-hosted User
4
5 Communities? The Case of Computer-controlled Music Instruments." *Organization*
6
7
8 *Science* 17 (1): 45–63.
9
- 10 Jeppesen, L. B., and K. Laursen. 2009. "The Role of Lead Users in Knowledge Sharing."
11
12 *Research Policy* 38: 1582–1589.
13
- 14 Kaiser, S., and G. Müller-Seitz. 2008. "Leveraging Lead User Knowledge in Software
15
16 Development—The Case of Weblog Technology." *Industry and Innovation* 15 (2): 199–
17
18 221.
19
- 20 Kaner, S. 2014. *Facilitator's Guide to Participatory Decision-Making*. San Francisco, CA:
21
22 Jossey-Bass.
23
- 24 Keinz, P., C. Hienerth, and C. Lettl. 2012. "Designing the Organization for User Innovation."
25
26 *Journal of Organization Design* 1 (3): 20–36.
27
28
- 29 Koch, S. and Artmayr, P. 2019. "Stability and Development of User Innovation Strategies for
30
31 Video Game Producers". *European Journal of Innovation Management*, 23 (5): 753-764.
32
33
- 34 Lakhani, K. R., and E. von Hippel. 2003. "How Open Source Software Works: 'Free' User-to-
35
36 User Assistance." *Research Policy* 32: 923–943.
37
38
- 39 Lettl, C., and H. G. Gemünden. 2005. "The Entrepreneurial Role of Innovative Users." *Journal*
40
41 *of Business and Industrial Marketing* 20: 339–345.
42
43
- 44 Lettl, C., C. Herstatt, and H. G. Gemuenden. 2006a. "Users' Contributions to Radical
45
46 Innovation: Evidence from Four Cases in the Field of Medical Equipment Technology."
47
48 *R&D Management* 36 (3): 251–272.
49
50
- 51 Lettl, C., C. Herstatt, and H. G. Gemünden. 2006b. "Learning from Users for Radical
52
53 Innovation." *International Journal of Technology Management* 33: 25–45.
54
55
56
57
58
59
60

- 1
2
3 Luthje, C., C. Herstatt, and E. von Hippel. 2005. "User-Innovators and 'Local' Information: The
4 Case of Mountain Biking." *Research Policy* 34 (6): 951–965.
5
6
7
8 Mollick, E., and R. Nanda. 2015. "Wisdom or Madness? Comparing Crowds with Expert
9 Evaluation in Funding the Arts." *Management Science* 62 (6): 1533–1553.
10
11
12 Morrison, P. D., J. H. Roberts, and E. von Hippel. 2000. "Determinants of User Innovation and
13 Innovation Sharing in a Local Market." *Management Science* 46: 1513–1527.
14
15
16
17 Nambisan, S., R. Agarwal, and M. Tanniru. 1999. "Organizational Mechanisms for Enhancing
18 User Innovation in Information Technology." *MIS Quarterly* 23 (3): 365–395.
19
20
21
22 Norwegian Ministry of Health Care and Services. 2011. St. meld. nr. 16 *Nasjonal helse og*
23 *omsorgsplan 2011–2015*. [Report No. 16 to the Storting. White Paper No. 16. (2010–
24 2011) National Health and Care Services Plan (2011–2015)].
25
26
27
28 Norwegian Ministry of Health Care and Services. 2009, 2011. St. meld. nr. 47
29 *Samhandlingsreformen—Rett behandling—på rett sted—til rett tid*. [Report No. 47 to the
30 Storting. White Paper No. 47 (2008–2009) The Coordination Reform—Proper
31 Treatment—at the Right Place and Right Time].
32
33
34
35
36
37
38 Opland, L. E., I. O. Pappas, J. Engesmo, and L. Jaccheri. 2022. Employee-driven Digital
39 Innovation: A Systematic Review and a Research Agenda. *Journal of Business Research*
40 143: 255–271.
41
42
43
44
45 Osborne, S.P., and L. Brown. 2013. Introduction: Innovation in Public Services. In: Osborne, S.
46 P., and L. Brown. (Eds.). *Handbook of Innovation in Public Services*. Edward Elgar,
47 Cheltenham, pp. 1–11.
48
49
50
51
52
53 Patton, M. Q. 2015. *Qualitative Research & Evaluation Methods*. 4th ed. Thousand Oaks, CA:
54 Sage.
55
56
57
58
59
60

- 1
2
3 Raasch, C., C. Herstatt, and P. Lock. 2008. "The Dynamics of User Innovation: Drivers and
4 Impediments of Innovation Activities." *International Journal of Innovation Management*
5
6 12 (3): 377–398.
7
8
9
- 10 Roy, R., and M. B. Sarkar. 2016. "Knowledge, Firm Boundaries, and Innovation: Mitigating the
11 Incumbent's Curse during Radical Technological Change." *Strategic Management*
12
13 *Journal* 37: 835–854.
14
15
16
- 17 Schiavone, F. 2020. "User Innovation in Healthcare: How Patients and Caregivers React
18 Creatively to Illness." *SpringerBriefs in Health Care Management and*
19
20 *Economics*. 1st ed. Cham, Switzerland: Springer.
21
22
23
- 24 Schweisfurth, T. G., and C. Herstatt. 2016. "How Internal Users Contribute to Corporate Product
25 Innovation: The Case of Embedded Users." *R&D Management* 46 (S1): 107–126.
26
27
28
- 29 Schweisfurth, T. G., and C. Raasch. 2015. "Embedded Lead Users—The Benefits of Employing
30 Users for Corporate Innovation." *Research Policy* 44 (1): 168–180.
31
32
33
- 34 Shah, S. K., and M. Tripsas. 2007. "The Accidental Entrepreneur: The Emergent and Collective
35 Process of User Entrepreneurship." *Strategic Entrepreneurship Journal* 1: 123–140.
36
37
38
- 39 Smith, S. W., and S. K. Shah. 2013. "Do Innovative Users Generate more Useful Insights? An
40 Analysis of Corporate Venture Capital Investments in the Medical Device Industry."
41
42 *Strategic Entrepreneurship Journal* 7: 151–167.
43
44
- 45 Tietz, R. C., P. D. Morrison, C. Lüthje, and C. Herstatt. 2005. "The Process of User Innovation:
46 A Case Study in a Consumer Goods Setting." *International Journal of Product*
47
48 *Development* 2 (4): 321–338.
49
50
- 51 Tietze, F., T. Pieper, and C. Herstatt. 2015. "To Own or Not to Own: How Ownership Impacts
52 User Innovation—An Empirical Study." *Technovation* 38: 50–63.
53
54
55
56
57
58
59
60

- 1
2
3 von Hippel, E. 1976. "The Dominant Role of Users in the Scientific Instrument Innovation
4 Process." *Research Policy* 5: 212–239.
5
6
7 von Hippel, E. 1986. "Lead Users: A Source of Novel Product Concepts." *Management Science*
8 32 (7): 791–805.
9
10
11 von Hippel, E. 2005. *Democratizing Innovation*. Cambridge, MA: MIT Press.
12
13
14 von Hippel, E. 2017. *Free Innovation*. Cambridge, MA: MIT Press.
15
16
17 von Krogh, G., and E. von Hippel. 2003. "Open Source Software and The "Private-Collective"
18 Innovation Model: Issues For Organization Science." *Organization Science* 14 (2): 209–
19 223.
20
21
22
23 von Krogh, G., and E. von Hippel. 2006. "The Promise of Research on Open Source Software."
24 *Management Science* 52 (7): 975–983.
25
26
27
28 Wadell, C., G. Ö. Sandström, J. Björk, and M. Magnusson. 2013. "Exploring the Incorporation
29 of Users in an Innovating Business Unit." *International Journal of Technology*
30 *Management* 61: 293–308.
31
32
33
34
35 [www.government.no](https://www.regjeringen.no/en/dep/hod/organisation-and-management-of-the-ministry-of-health-and-care-services/Departments/the-department-of-hospital-ownership/id1413/) Full URL available at: [https://www.regjeringen.no/en/dep/hod/organisation-](https://www.regjeringen.no/en/dep/hod/organisation-and-management-of-the-ministry-of-health-and-care-services/Departments/the-department-of-hospital-ownership/id1413/)
36 [and-management-of-the-ministry-of-health-and-care-services/Departments/the-](https://www.regjeringen.no/en/dep/hod/organisation-and-management-of-the-ministry-of-health-and-care-services/Departments/the-department-of-hospital-ownership/id1413/)
37 [department-of-hospital-ownership/id1413/](https://www.regjeringen.no/en/dep/hod/organisation-and-management-of-the-ministry-of-health-and-care-services/Departments/the-department-of-hospital-ownership/id1413/)
38
39
40
41
42 Yadav, V., and P. Goyal. 2015. "User Innovation and Entrepreneurship: Case Studies from Rural
43 India." *Journal of Innovation and Entrepreneurship*. 4: 5.
44
45
46
47 Yin, R. K. 2014. *Case Study Research: Design and Methods*. Thousand Oaks, CA: Sage.
48
49
50
51 Yu, X. 2021. "Differences Between End User Innovators and Embedded User Innovators in
52 Diffusion Channel Selection: The Moderating Role of Technological Advances."
53 *European Journal of Innovation Management*, 25 (4): 997-1036.
54
55
56
57
58
59
60

Table 1. User innovators and support mechanisms

Type of user innovator	Context	Support mechanisms	Benefit
<p>External user innovators: Non-employees who contribute their ideas, experience, or knowledge to an organisation to create something new that better suits commercial user needs</p> <p>Studies: DeMonaco et al. 2006; Jeppesen and Laursen 2009; Kaiser and Müller-Seitz 2008; von Hippel 1986; Lettl et al. 2006a; Chatterji and Fabrizio 2014; 2012; Hienerth et al. 2011; Jeppesen and Frederiksen 2006</p>	<p>Producer companies</p>	<p>Support required to insource external users into the company on a temporary basis, i.e. involvement, knowledge creation and adoption decisions</p> <p>Studies: Roy and Sarkar 2016; Di Gangi and Wasko 2009; Keinz et al. 2012; Nambisan et al. 1999</p>	<p>For sale in the consumer market</p>
<p>Internal (hired) user innovators: Typically, lead users hired into the firm as employees who contribute their ideas, experience, or knowledge to create something new that better suits the organisation's internal and/or commercial use</p> <p>Studies: Block, et al. 2016; Wadell et al. 2013; Schweisfurth and Raasch 2015; Schweisfurth and Herstatt 2014</p>	<p>Producer companies</p>	<p>Support in terms of incorporating users, i.e. diffusion agents and managerial challenges to balance users against other knowledge domains</p> <p>Studies: Wadell et al. 2013; Schweisfurth and Raasch 2015</p>	<p>For sale and internal use</p>
<p>Public user innovators: Professionals (not hired for their lead user capacities), i.e. staff (hospital personnel) and end users (patients) who contribute their ideas, experience, or knowledge to create something new that better suits their own use</p>	<p>Public organisation, i.e. a non-producer company, such as a hospital</p>	<p>To be explored in this study</p>	<p>For own use and welfare</p>

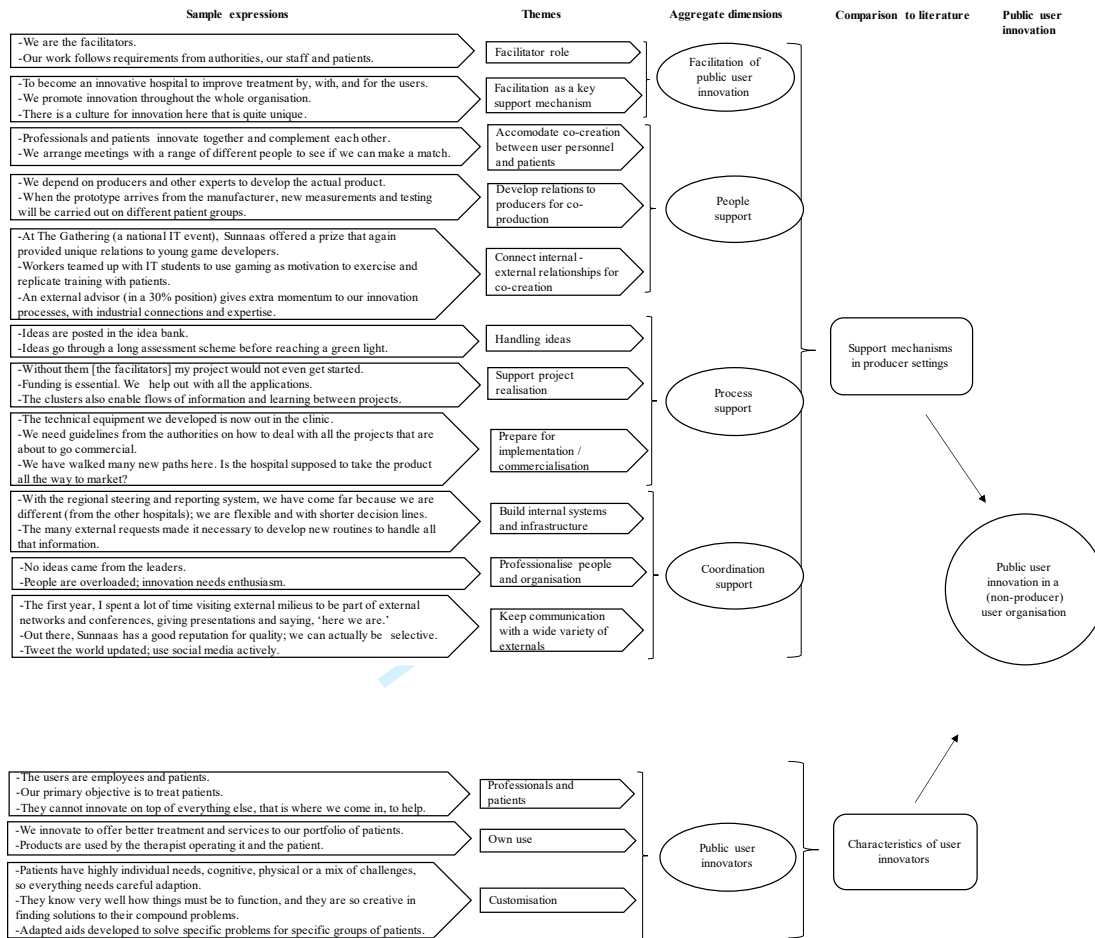
Table 2. Overview of data sources

January 2014–December 2015			
Data sources		Settings	Participants
Primary source	Observations at the hospital	<ul style="list-style-type: none"> • Eight team meetings (2–3 hours each) held every other month 	<ul style="list-style-type: none"> • Regular team members: doctors, nurses, ergonomist, speech therapist, physiotherapists, psychologist, patient representative, network representative, the CEO, leaders of the three hospital departments
Secondary source	Written material	<ul style="list-style-type: none"> • Used in team meetings, particularly minutes of every meeting and innovation and activity plans • Other written and electronic materials 	<ul style="list-style-type: none"> • Minutes, reports, activity plans, innovation plans, slide presentations, assessment procedures, strategy documents, policy letters, applications, hand-outs, etc. • Websites, archival records, information about external partners/collaborators, national and regional policies, funding sources, social media, etc.
January 2012–December 2015			
Tertiary source	Other observations at the hospital	<ul style="list-style-type: none"> • Four one-day innovation gatherings • One one-day “Wish I had” seminar • Meetings with potential and actual external collaborative partners • One 1.5-year user innovation project (from prototype development to commercialisation) 	<ul style="list-style-type: none"> • Facilitators, personnel, patients, business companies and other externals, e.g. researchers, students, collaborators from other hospitals and municipality healthcare • Facilitators, users, companies (including start-ups) and networks • User innovators, facilitators, production company, user personnel and public representatives
	Informal talks	<ul style="list-style-type: none"> • One cluster meeting • Two team meetings • Before, during and after breaks in all meetings and seminars with participants, particularly the facilitators 	<ul style="list-style-type: none"> • Internal members • Regular team members • Internals and externals: hospital employees, patients, external collaborators and networks

	Interviews	<ul style="list-style-type: none">• Two facilitator interviews (two hours)• One user personnel interview (two hours)• Three user patient interviews (5 hours in total)	<ul style="list-style-type: none">• Head of innovation• Physician• Long-term patient
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Table 3. Support mechanisms for user innovation in organisations

User organisation		
Type	User innovation in a public organisation	User innovation in a producer company
Characteristics		
User role	Public user innovators	External user innovators or lead user innovators
Scope	High degree of customisation, small-scale, for welfare and use in own organisation	Large scale mass production for commercial consumer market users
Benefit	Direct-use benefit	Primarily indirect use benefit (through producers' sales to users)
Support		
Facilitation	Organisational facilitation of user innovation throughout the enterprise on a holistic and permanent basis. Culture for user innovation embedded into daily activities and practice.	Facilitation of particular units or divisions that hire lead users or that utilise external user knowledge in temporary, early phases or limited events
People	Co-creation among a broad mix of users, facilitators, producers and other stakeholders	Co-creation between (lead) users and manufacturers in the production process
Process	Gather, validate and approve internal ideas. Realisation through outsourced co-production with producers. Internal implementation of the user innovations.	Gather, validate and approve external ideas. Realisation through co-production with insourced users. Commercialisation of the user innovations by the producer.
Coordination	Large ecosystem of infrastructure for internal and external communication with a wide variety of collaborators (private and public sector) in all phases of development, production and implementation.	Primarily delimited search, harvesting, cooperation or (to some extent) ecosystem coordination with relatively few users in relation to early phases of idea generation and production



management