

# Open Innovation for Wicked Problems: USING PROXIMITY TO OVERCOME BARRIERS

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[journals.sagepub.com/home/cm](https://journals.sagepub.com/home/cm)**Ward Ooms<sup>1</sup> and Roel Piepenbrink<sup>1</sup>****SUMMARY**

Open innovation is a viable strategy to solve wicked problems. However, the complexity of these types of problems renders the management of open innovation initiatives (even) more difficult. How can managers make open innovation for complex or even wicked problems work? This article examines case studies of open innovation initiatives adopting a health care service innovation. It uses the proximity framework to identify several ways in which open innovation barriers can be overcome despite their complexity. The case study findings show how partners leverage their differences to the benefit of service innovation in the face of wicked problems.

**KEYWORDS:** open innovation, open service innovation, adoption, public-private collaboration, health care

**O**pen innovation is about the purposive management and utilization of knowledge flows to and from external partners for innovation.<sup>1</sup> Open innovation strategies have become part of a portfolio of innovation practices for innovation-generating firms, and a viable alternative to practices of closed innovation. Several recent studies have demonstrated that open innovation has the potential to generate solutions to complex or even “wicked” problems.<sup>2</sup> According to these studies, this potential rests on the ability to manage and involve very diverse types of organizations<sup>3</sup> in open innovation, and to acquire diverse knowledge from them.<sup>4</sup>

Prior literature provides a taxonomy of the nature of problems that helps to differentiate between “tame,” “complex,” and “wicked” problems.<sup>5</sup> At one end of the spectrum, a “tame” kind of problem is one where both problem and solution can be easily defined, little learning is required to tackle the problem, and

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neither problem nor solution is up for debate by anyone involved. At the other end of the spectrum, “wicked” problems are those problems for which problem and solution are unclear, significant learning is required to tackle the problem, and both the problem and the solution may be disputed by those involved.<sup>6</sup> Wicked problems are often policy problems that involve the public sector and need real-life validation.<sup>7</sup> Yet the correct identification of complex problems is also an important issue in the strategic decision-making of companies,<sup>8</sup> and one that becomes all the more difficult the more wicked a problem is.<sup>9</sup> An example of a wicked problem is that of governments trying to stimulate the transition toward CO<sub>2</sub>-neutral mobility and to create the corresponding infrastructure. This is the kind of problem that involves (the potentially conflicting stakes of) many different stakeholders, and a high degree of uncertainty. Moreover, there are multiple potential solutions, each with unforeseen consequences, all of which makes solving the problem a daunting task. The degree of uncertainty and the divergence of stakeholder perspectives associated with increasingly complex (or even wicked) problems may mean that taking an open innovation approach becomes progressively more appealing. This is because open innovation models have the ability to source diverse knowledge and coordinate the efforts of multiple organizations. To this end, collaborative strategies used to cope with such problems are often recommended in studies of public planning and public policy,<sup>10</sup> which reaffirms open innovation scholars’ suggestions. Hence, in line with previous research, there appear to be many reasons as to *why* open innovation should be the go-to option when trying to solve increasingly complex problems,<sup>11</sup> which gives rise to the next question of *how* to use open innovation for this purpose.

There are many studies that document how firms can open up to partners and manage the associated risks involved (e.g., free-riding, cheating, leakage of intellectual property (IP), and uncooperativeness) in order for them to attain the benefits of openness.<sup>12</sup> However, progressively high-quality management processes are likely required to be able to manage openness and attain open innovation benefits in increasingly complex projects, due to “the number and variety of actors, groups, and organizational units involved in a complex issue.”<sup>13</sup> Yet while managing openness is bound to become more difficult as the complexity of problems increases, research addressing how organizations should manage openness under such circumstances is currently limited. Existing studies on open innovation for complex projects<sup>14</sup> have focused on new product development, where complexity is limited to the number and interdependence of product components.<sup>15</sup> The wicked problems described by Rittel and Webber,<sup>16</sup> however, are complex in many more respects. Moreover, open innovation research to date has been largely firm-centric,<sup>17</sup> and it has mostly considered partnering between profit organizations.<sup>18</sup> According to a recent influential review of open innovation literature, it therefore offers little guidance to managers in complex projects that call for “a mix of public and private, for-profit and non-profit organizations . . . to maximize their effectiveness,”<sup>19</sup> as in the case of wicked problems.

The aim of our study is to investigate *how* to manage openness in increasingly complex projects in order to capitalize on the acclaimed potential of open

innovation to solve complex problems. To that end, we draw on the proximity literature.<sup>20</sup> The proximity framework considers the effects of various dimensions of proximity between partners on innovation: geographical, cognitive, organizational, institutional, social, and personal proximity.<sup>21</sup> These proximity dimensions are widely known to drive all kinds of managerial decisions, and also known to affect the success of collaborative approaches to innovation.<sup>22</sup> Managers juggle with proximity and distance all the time when making partnering decisions.<sup>23</sup> Depending on the task at hand, their firms will need different partners at varying distances to them. For example, managers consider geographical proximity to potential partners. When they want to gain market access firms will typically seek geographically distant partners, but for hands-on work on new product development they will usually resort to partners that are geographical close to them and therefore easy to visit. Several open innovation scholars have suggested that the proximity framework may be useful in terms of understanding the sources of typical barriers to open innovation.<sup>24</sup> Yet thus far, no systematic attempt has been made to understand the enablers of and barriers to open innovation using the proximity framework.

While it is clear that proximity can help partners attain success in complex projects, it is unlikely that proximity will be strong on all dimensions of the aforementioned framework. For example, the knowledge that various partners may bring to a project may be highly diverse, resulting in weak cognitive proximity. However, existing research on proximity demonstrates that certain dimensions of proximity can substitute for other dimensions. For example, it has been shown that social proximity can substitute for organizational proximity and geographical proximity in collaborations between top nanotechnology scholars.<sup>25</sup> Furthermore, social proximity was found to be a good substitute for geographical proximity in collaborative innovation by Danish cleantech organizations.<sup>26</sup> Put simply, proximity on one dimension can help partners to set aside or overcome their differences on another dimension. Moreover, this research also suggests overlap effects,<sup>27</sup> for example, having both geographical proximity and institutional proximity to partners exerts a positive effect on innovation that goes above and beyond the positive effect of having proximity on just one of these dimensions. These substitution- and overlap-effects could be beneficial to partners in increasingly complex open innovation projects, where proximity is likely to be weaker on some dimensions than others.

We conducted a multiple case study of exemplary cases of open innovation initiatives. The five case studies can be considered exemplary because the problem they try solve by adopting and implementing a service innovation exhibits at least seven out of the ten characteristics of wickedness put forward by Rittel and Webber,<sup>28</sup> as we later outline in the “Method” section. More specifically, we followed five partnerships in the Netherlands that aim to adopt and implement a new service innovation in the care of dementia patients, called DemenTalent. There are pressing demographic developments (e.g., the fact that global life expectancy will continue to grow<sup>29</sup>) that urgently call for new ways to deal with patients facing all kinds of disease more effectively and affordably. Moreover, there is not

much time—and little room for failure—in doing so. DemenTalent is a service innovation that aims to prolong societal engagement and extend the economically productive lives of dementia patients—assumed to benefit both the medical condition of patients as well as health care expenditures at large—in order to address this issue.

For scholars, this study contributes to theory development about open innovation, responding to a recent call for more research in this field in a review by the open innovation community of scholars.<sup>30</sup> We do so by using the proximity framework to better understand sources of barriers to open innovation and their potential remedies.<sup>31</sup> Our study also responds to calls for research into the application of open innovation in non-business innovation-adopting organizations in health care.<sup>32</sup> Furthermore, it advances our understanding of open innovation for complex projects outside the field of new product development,<sup>33</sup> instead focusing on complex projects in service innovation.

For managers in public and private organizations, our case studies point to strategies that can be used to select the right open innovation partners, as well as to specific interventions that can be used to manage openness when solving complex problems. For policymakers, we elucidate how open innovation can be used as a strategy to solve complex or even wicked policy problems in collaboration with stakeholders. For both policymakers and managers, understanding how proximity may be used to leverage differences between partners—or how it can counteract typical barriers to open innovation—will be helpful in terms of generating or adopting innovations to complex problems that require the involvement of a great diversity of partners.

## Theoretical Background

### *Managing Open Innovation: Barriers Appear as Problems Get More Complex*

The term open innovation was coined in Chesbrough's seminal books.<sup>34</sup> However, practices used to open up a firm to engage with outsiders have existed for much longer.<sup>35</sup> Open innovation refers to firms that open up their innovation processes to a certain degree, because by doing so they can obtain advantages from their exchange with external parties.<sup>36</sup> The success of open innovation, however, rests largely on an organization's ability to manage openness, along with the barriers and risks associated with it.<sup>37</sup> Literature on open innovation to date has therefore largely focused on understanding what is needed to manage openness and to identify barriers to open innovation. One such barrier, the "Not-Invented-Here" syndrome (NIH),<sup>38</sup> is a phenomenon whereby internal R&D staff tend to view external technology in a less positive light than internally developed knowledge and innovations (even when that external technology is technologically superior). It is often the result of the diversity in partners' knowledge and goals. Other important attitudinal barriers have also been identified, including the "All-Stored-Here" syndrome (ASH; an attitude of disregard to what the

organization may learn from external partners) and the “Only-Used-Here” syndrome (OUH; a fear of doing something that it is in the diverging interests of competitors).<sup>39</sup> Furthermore, research has identified several barriers of a managerial nature, related to the challenges of managing organizational changes, managing external relationships, protecting critical internal know-how, identifying sources for potential new innovations, and effectively protecting one’s own IP.<sup>40</sup>

Firms in industries characterized by high appropriability are most likely to open up their innovation processes, and it is easy to see why. These firms have sufficient mechanisms in place within the industry to protect their IP (e.g., patents, registration of design, trademarks) and to capture value from open innovation.<sup>41</sup> In other words, they are more able to manage the risks of opening up than firms in other, low-appropriability industries. For this reason, many studies of open innovation are set in the health care industry. Good examples include large organizations in pharmaceuticals<sup>42</sup> or medical equipment manufacturing,<sup>43</sup> because new drugs or new technologies under development can be protected in several ways.

However, for the same reason, there are several gaps in the literature (on open innovation in health care) that render our understanding of managing openness meaningless to managers in organizations in part of the health care value chain that relies less on appropriability regimes—or may not have the same mechanisms at their disposal to overcome well-known barriers. First, several recent reviews point to the fact that open innovation research has mainly focused on technological innovation and product innovation, at the expense of attention for service innovation.<sup>44</sup> Second, there is little research on open innovation in instances where profit and nonprofit partners work together.<sup>45</sup> Open innovation research to date has been firm-centric in its approach,<sup>46</sup> also covering small and medium-sized firms.<sup>47</sup> Only recently have some scholars investigated how to deal with barriers to open innovation in the public sector, but not specifically in public health care.<sup>48</sup> This is an issue because public sector organizations make up an important part of the health care value chain worldwide.<sup>49</sup> Third, although there are plentiful studies on open innovation in health care, only a few are interested in parties in the value chain that are patient-facing. To the extent that these studies are available, they are set in large organizations such as hospitals,<sup>50</sup> thereby overlooking the many small and medium-sized organizations that are also delivering health care directly to patients (e.g., local physician’s practices, specialized clinics, and nursing homes). Innovation in these kinds of organizations is likely oriented more strongly toward adopting innovations that are new-to-the-firm in collaboration with their value chain partners, and less toward generating innovations that are new-to-the-market.<sup>51</sup> In summary, it is not possible to simply generalize findings from existing open innovation research to open innovation in a health care setting.

### ***Open Innovation for Complex and Wicked Problems***

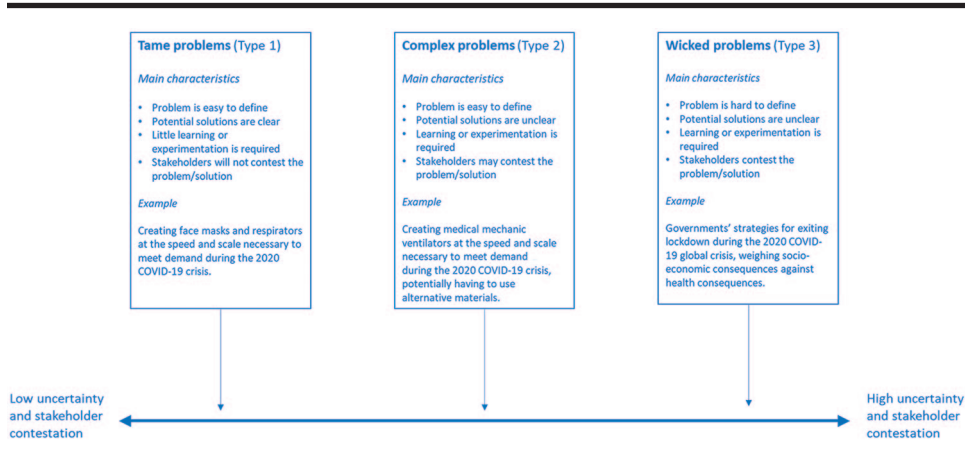
Recent literature has started to explore open innovation for complex projects in product innovation, drawing on Simon’s theorizing about complex

systems.<sup>52</sup> These studies conceptualize innovation as a process of recombinant search and argue that this process will get more complex as new products require a higher number of existing and/or new components, ideas, and processes to be combined—and even more complex still when these components are also interdependent.<sup>53</sup> Notwithstanding the difficulties of managing open innovation between firms in these kinds of projects, this perspective may lend itself better to understanding open innovation for solving complex problems of product innovation than to understanding open innovation in relation to the “wicked” problems that Bogers and colleagues suggest we should seek to solve using open innovation.<sup>54</sup> In these types of problems, it is not just the number and interdependence of components of the solution that cause complexity; there are additional sources of complexity that characterize the problem at hand. That is, firms involved in complex projects of product innovation are found to rely mostly on cooptation, networking, or science-based open innovation,<sup>55</sup> which means that these firms choose to partner with other firms in their industry, with scientific institutes with related expertise, or with multiple types of partners working with similar technologies. However, to address wicked problems, input is likely required from even more diverse partners (partners not part of the industry or the value chain, non-firm partners, consumers, etc.). The more diverse the partners that are involved, the more difficult the management of these partnerships will be.<sup>56</sup> In order to understand how open innovation can be used to tackle increasingly complex or even wicked problems,<sup>57</sup> we first need to understand the nature of these problems.

Against a backdrop of major challenges that face today’s society, the concept of the wicked problem has turned into somewhat of a policy and management fad. Academics and policymakers tend to stretch the boundaries of Rittel and Webber’s original conceptualization of problem types, and they are quick to categorize any problem as wicked.<sup>58</sup> Originally, whether or not a problem was “tame,” “complex,” or “wicked” was judged by checking whether it exhibited all ten characteristics of wickedness<sup>59</sup>:

- There is no definitive formulation of a wicked problem.
- Wicked problems have no “stopping rule,” or, in other words, there is no definitive solution to them.
- Any solution is good or bad, but never true or false.
- There is neither an immediate nor an ultimate test of the solution to a wicked problem.
- Attempts at solving these problems may have irreversible or unforgettable (undesirable) effects.
- Wicked problems have no clear solution or set of alternative solutions.
- Every wicked problem is essentially unique.
- Every wicked problem may be a symptom of another (higher-level) problem.
- There are multiple explanations for a wicked problem.
- There is no room for solutions to fail.



**FIGURE 1.** A spectrum of problem types.

More recent literature has demonstrated that very few problems actually meet all of these criteria,<sup>60</sup> and therefore it questions the strict application of these criteria and the almost intractable conceptualization of the wicked problem by arguing that “not all problems are simply tame or simply wicked.”<sup>61</sup> Any problem that meets all criteria, a truly wicked problem, would be nearly impossible to solve. A more pragmatic approach to characterizing the complexity of problems entails the identification of a spectrum of problem types. This allows for the more accurate classification of the different features and complexities of the problem at hand. In this taxonomy, “tame problems” are considered so-called type 1 problems, where “both the definition of the problem and the likely solution are clear.”<sup>62</sup> Tame problems therefore require little learning and are usually not disputed among stakeholders. Complex problems, or type 2 problems, may be relatively easy to formulate, but the solution is not immediately clear.<sup>63</sup> These kinds of problems require learning in order to be solved. Additionally, stakeholders’ perspectives on the appropriate solution may need to be aligned. Hence, complex problems usually exhibit at least some of Rittel and Webber’s characteristics of wickedness. Wicked problems, or type 3 problems, exhibit most—or all—of the characteristics of wickedness. Here, both the problem and the solution are unclear, and considerable learning is required in order for them to be understood. Furthermore, both the problem and the solution may be disputed by stakeholders.<sup>64</sup>

We propose that the complexity of problems can best be understood by assessing the nature of the problem—and its solution—on a spectrum that captures both the extent of *uncertainty* about the problem and/or solution, and, relatedly, the extent of *stakeholder contestation* of the problem and/or solution. In doing so, we acknowledge that when uncertainty about a given problem or solution increases, it will also imply more stakeholder contestation, and vice versa. We present this spectrum in Figure 1 and provide a simplified overview of the main characteristics—and an illustrative example related to the 2020 COVID-19 crisis—for each problem type. The rationale behind this figure is that as uncertainty

**TABLE I.** Overview of Proximity Dimensions.

Proximity Dimension	Definition
Geographical	The pure physical distance between the location of different partners.
Institutional	The similarity of formal and informal rules and regulations imposed by specific administrative geographical territories, such as countries and regional entities, including cultural aspects, that different partners are subject to.
Social	The extent of different partners' embeddedness in the same networks, related to knowledge fields, professional associations, or other social communities.
Organizational	The similarity of organizational objectives and organization-specific formal and informal rules and regulations (including aspects of organizational culture) of the different partners.
Cognitive	The similarity in ways of thinking of partners, technical language used by partners, as well as partners' "know-how" and "know-what."
Personal	The similarity in different partners' personal character traits, behavioral patterns, and the extent of enjoyment of one another's company.

Source. Adapted from Claudia Werker, Ward Ooms, and Marjolein C. J. Caniëls, "Personal and Related Kinds of Proximity Driving Collaborations: A Multi-Case Study of Dutch Nanotechnology Researchers," *SpringerPlus*, 5 (2016): 1751; Franz Huber, "On the Role and Interrelationship of Spatial, Social and Cognitive Proximity: Personal Knowledge Relationships of R&D Workers in the Cambridge Information Technology Cluster," *Regional Studies*, 46/9 (2012): 1169-1182.

and stakeholder contestation about a problem increase, the problem is likely to meet more of the criteria for wickedness, and thus its complexity increases in parallel.

### ***Theoretical Framework: Using Proximity to Overcome Complexity***

Proximity acts as a multidimensional mechanism for coordination between two or more collaborating organizations or individuals.<sup>65</sup> Managers may exercise their control over some of these proximity dimensions when making partnering choices in order to set up partnerships best suited to meet their strategic needs.<sup>66</sup> The proximity literature provides a framework that can be used to analyze collaborations on six dimensions of proximity that may interact in coordinating these collaborations and in shaping their innovation outcomes. These proximity dimensions are geographical proximity, institutional proximity, cognitive proximity, organizational proximity, social proximity, and personal proximity.<sup>67</sup> In Table 1, we define these proximity dimensions. The common proximity hypothesis entails that partners in innovation will benefit from "being close, but not too close" to one another on various dimensions, and it is also referred to as the proximity paradox.<sup>68</sup> Hence, it suggests an inverse U-shaped relationship between proximity and innovation.

Decision makers in organizations are known to factor in proximity dimensions when making partnering choices for innovation. For different reasons, they



may seek partners who are either proximate or distant on different proximity dimensions. Geographical proximity, for example, is shown to be particularly sought after in partnerships involved in product development, whereas geographical distance is often desired in partnerships aiming to establish market access or to lower cost.<sup>69</sup> Empirical evidence also shows how collaborators can use proximity dimensions as substitutes to one another, for example, personal proximity may substitute geographical proximity in those collaborations where achieving geographical proximity to partners is costly or complicated.<sup>70</sup> The proximity framework thus provides a range of options, meaning that organizations can choose the appropriate coordination mechanisms given the nature of their collaborations.

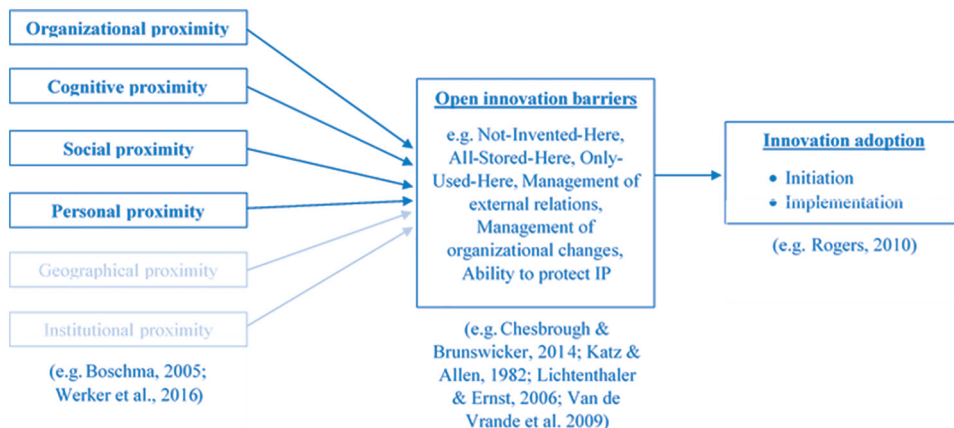
It follows, then, that proximity as a coordinative mechanism may also hold the key to managing openness in innovation. Although well-known open innovation barriers are not consistently linked to any particular theoretical framework, the solution to many of these barriers can potentially be understood by using the proximity framework. There are some examples of previous open innovation studies that point to proximity as a means of understanding the challenges of managing open innovation.<sup>71</sup> Below, we offer a brief summary to shed light on how proximity may help organizations to deal with their partners in open innovation when solving complex or wicked problems. We focus on the four dimensions of proximity that we were able to investigate in our study.

*Organizational proximity* may be a solution to open innovation barriers of a managerial nature. There are many empirical studies that link organizational proximity to the innovation outcomes of partnerships, but the findings about the exact nature of the effect of organizational proximity are mixed.<sup>72</sup> Recent research may resolve this issue, as it differentiates between “hard” (e.g., patents, products) and “soft” (e.g., support for ideas, joint programs, and shared knowledge) outcomes of innovation, and suggests that organizational proximity may be most conducive to the latter.<sup>73</sup> We therefore suggest that organizational proximity may be of particular relevance to partners’ ability to effectuate the necessary organizational changes, to manage external relationships, and to overcome the well-known syndromes within their organizations (NIH, ASH, and OUH).

*Cognitive proximity*—which denotes similarity in technical language, ways of thinking, know-how, and know-what<sup>74</sup>—helps partners to understand and exploit synergies in each other’s knowledge. These synergies—or complementarities—may hold potential for innovation. However, too much similarity rules out any opportunity to learn from one another, and too little similarity can result in misunderstanding.<sup>75</sup> Clearly, this proximity dimension could play an important role in overcoming open innovation barriers. Barriers to open innovation are less likely to be encountered when there is strong—but not too strong—cognitive proximity. That is, the NIH syndrome may be less of a concern when engineers can comprehend the different way of working used by their partners’ engineers, and it may be easier to identify opportunities for innovation with partners who are cognitively close.

*Social proximity* reflects the structure of network relationships between two or more partners as part of a larger network<sup>76</sup>; having social proximity may allow

**FIGURE 2.** Theoretical Framework: Overcoming barriers to open innovation by using proximity.



Note. Relationships in gray are not discussed in the theoretical framework or included in the case study analysis due to the homogeneity of cases on these dimensions. IP = intellectual property.

for individual-level relationships to form for the purpose of the initiative. Empirical research has demonstrated that social proximity is an important impetus for the formation of innovation networks.<sup>77</sup> However, again, certain caveats apply. If social proximity is too weak, this may create a barrier to open innovation, rendering partners unable to garner support due poor network connections. On the other hand, if social proximity is too strong, this may result in the creation of in-groups and out-groups within network structures that cause partnerships to dysfunction.<sup>78</sup> Social proximity can, however, also help to overcome open innovation barriers, as partners may derive trust from being socially close.<sup>79</sup> This trust may help to counteract such things as ASH syndrome, since organizations become more open to what they might be able to learn from their partners.<sup>80</sup>

*Personal proximity* has been shown to be conducive to the formation of partnerships,<sup>81</sup> as well as to the functioning of partnerships.<sup>82</sup> Nevertheless, having particularly weak or strong personal proximity between partners is undesirable for innovation, as this can be associated with inertia or immoral conduct,<sup>83</sup> among various other problems. Hence, personal proximity could also constitute a source of managerial and relational barriers to open innovation. Weak personal proximity may also be associated with attitudinal barriers, particularly NIH syndrome, which is argued to be linked to problems in intra-organizational communication and issues of individual and social identity.<sup>84</sup> However, hinting at inverse U-shaped relationships, studies also clearly point to the benefits of personal proximity, which may act as a lever to make the most of open innovation initiatives by overcoming barriers and substituting for weaker proximity on other dimensions.<sup>85</sup>

In Figure 2, we summarize the theoretical framework that underlies the current study. This framework reflects our tentative proposition that various dimensions of proximity can either be a source of barriers or enablers of open

innovation (depending on the extent of proximity), and thereby affect open innovation adoption.

## Method

### *Research Design and Sampling*

We conducted a multiple case study of exemplary cases.<sup>86</sup> We studied five regional open innovation initiatives in the Netherlands in which partners adopt and tailor a service innovation in health care, called DemenTalent. This novel therapy for dementia patients was originally developed by two social entrepreneurs (Bureau DAZ) and is an award-winning concept.<sup>87</sup> In short, the concept of the new service is to provide dementia patients with a volunteer work placement—tailored to their interests and abilities—within a business or an organization, instead of offering them more traditional and generic day care activities in an isolated and purpose-built location. Several locally funded regional partnerships between nursing homes, social care or welfare organizations, municipalities, and a knowledge broker were set up in the Netherlands to introduce, adopt, and tailor the service at the level of local health care value chains. Local partners in these initiatives collaborated to set up a tailored local concept for the new service, to promote the new service, and to (re)organize the local system of referrals in order to encourage health care professionals, patients, and potential work places to use the new service. In the Appendix, we provide background information about the health care system and care of the elderly in the Netherlands, its problems, the Dutch policy for dementia care, and the concept and impact of the DemenTalent service innovation.

For reasons related to theoretical replication, selection criteria stipulated that cases should all be open innovation partnerships adopting the same service innovation in trying to solve the same problem, based within the Netherlands, at the level of the local health care value chain, and should differ in the extent of proximity between partners on four dimensions. Findings from our case studies may be generalized to open innovation initiatives developing or adopting service innovations for problems that exhibit many characteristics of wickedness.

The five cases are exemplary because they are open innovation initiatives and because the problem that they try to solve exhibits a considerable degree of wickedness (it meets at least seven out of ten characteristics of wicked problems as put forward by Rittel and Webber<sup>88</sup>). Regarding *uncertainty* of the problem and its solution, the open innovation initiatives all aspire to address a particular problem (roughly, “improving the condition of dementia patients and the cost-effectiveness of the dementia care system”) that is hard to define, thereby meeting the first criteria for wickedness. Furthermore, with respect to solutions, there is not a clear set of alternative solutions available, fulfilling a second criterion for wickedness. Even though medical research understands much about the disease, there is certainly not a full understanding of how best to treat, let alone cure, dementia—nor about how to do this in the most cost-effective way. This brings us directly to the third characteristic that is related to *stakeholder contestation* of the problem and

solution: there is no true or false solution to the problem at hand, there are merely good and bad solutions.<sup>89</sup> Some stakeholders may not agree with the idea that disengagement with society is a problem, and/or that the proposed DemenTalent solution is a good one (e.g., they may question the predicted health benefits of the solution, or the cost-benefit ratio). In other words, both problem and solution may be disputed.<sup>90</sup>

As noted, the typical health care value chain is composed of a diverse range of public and private organizations (e.g., hospitals, pharmaceutical firms, health insurance firms, public organizations, local physician's practices, private clinics, and nursing homes).<sup>91</sup> Generally, the goals of these health care organizations are not (solely) financial, but often (also) non-financial. Organizations along the health care value chain may be focused on cost reduction, but typically also aspire to cut costs without sacrificing health care quality or risking medical errors,<sup>92</sup> with each objective carrying a different weight for different organizations. Value disagreements are therefore likely to exist between the partners in these projects. Looking beyond the health care value chain itself, other stakeholders are involved whose interests and value perspectives add to the complexity of the problem. Consider, for example, the patients and their families. Even within that group of stakeholders there may be some who value prolonged engagement of their relatives with society, while others may prioritize the provision of care for their relatives in highly protective health care environments. For these reasons, the problem at hand also meets the fourth criterion of not having a stopping rule: there is no clear way to tell when the problem has been solved.<sup>93</sup> At some point, the partners may decide they have reached a "good enough" solution, because either their "time, or money, or patience" has run out.<sup>94</sup> Additionally, there is not an immediate way to assess the success of a solution to the problem, a fifth characteristic of wickedness. What may seem to be a successful solution at first (which seems to be the case for DemenTalent, see the Appendix), may later turn out to have undesirable consequences as well. Sixth, although the problem is not unique in the sense that many countries across the globe are faced with aging populations, there is not an easy way of taking the lessons learned from other countries and applying these solutions to this particular problem. This is because there are considerable differences in the health care systems and the implementation of policies across different countries, making any copy-paste solutions all but impossible. This is the case even at the regional level of our cases, where the initiatives involve different partners, different kinds of stakeholders, and compete with different existing dementia care services. Finally, every wicked problem can be considered the symptom of yet another wicked problem,<sup>95</sup> and this seventh characteristic also applies to the problem at hand. There are many higher-level problems related to the issue of improving the effectiveness and efficiency of local dementia care (such as the pressing rate at which the population in need of care is aging, see the Appendix).

### ***Data Collection***

In total, there are 23 unique partner organizations within the five initiatives. One organization is a partner in all projects, the firm of the two social

entrepreneurs, who the interviewees refer to as “the knowledge broker.” Our case study database includes 32 transcripts of semi-structured interviews with 24 unique interviewees from 19 of those partner organizations, and an additional 72 documents from or about the cases studied. Interviewees were not available from four partner organizations in four different regions, but we were able to collect secondary data (documents) from and about these partners. We identified interviewees with different roles within the local initiative (strategic, organizational, and operational) and from different partners within the local initiative (e.g., health care organizations, social entrepreneurs, and municipalities). We conducted multiple interviews with some interviewees over an extended period of time<sup>96</sup> so that we could follow up on themes that emerged during interviews with other partners. The secondary data collected were documents about all cases at the project level or at the level of individual partners, and included policy documents, meeting minutes, agreements, memorandums, letters and emails, as well as public information collected from partners’ websites. Our methods of data collection were designed to safeguard construct validity and reliability.<sup>97</sup>

We conducted in-depth semi-structured interviews in which our aim was to construct a chronology of the open innovation initiatives by asking *how* and *what* questions about the initiatives in order to gather credible interview data.<sup>98</sup> We asked questions about the state of the service’s implementation, for example, about how the open innovation projects were started, and about the embeddedness of the project in the local health care value chain as well as its routines. While discussing the different partners involved, we also gathered information about the proximity of partners on certain dimensions thereof. Several questions were devoted to understanding individual-level collaboration within the project in order to assess proximity dimensions at that level (i.e., cognitive proximity, personal proximity, and social proximity). In the closing questions, we asked interviewees to offer a piece of advice that they would give to other regions who might wish to introduce the new service, based on their experiences in their own region, and to describe the most positive results of the local project. Their answers gave us additional information with which to evaluate the process and outcomes of the initiatives.

### ***Data Analysis***

The purpose of our analysis was to understand how open innovation initiatives use proximity to overcome open innovation barriers. We excluded geographical and institutional proximity from the analysis, as all cases are homogeneous in this respect due the sampling criteria.<sup>99</sup>

Via a stepwise approach, we compared cases in order to build theory. First, we transcribed and stored all data (interviews, documents) using Atlas.ti software for qualitative data analysis, organizing the data per case, to improve the reliability of our analyses.<sup>100</sup> Second, we proceeded to code all data with a predefined list of codes to identify segments of interviews and documents referring either to any of the four proximity dimensions or to the outcomes of the open innovation initiatives. We based our list of codes on the initial theoretical framework in order to

establish internal validity.<sup>101</sup> Proximity dimensions were coded using the elements of the definitions provided in Table 1 as codes. In instances of cognitive proximity, for example, we coded interview segments referring to partners “know-what” whenever individual partners’ educational backgrounds were discussed in the interviews. This is a commonly used indicator of cognitive proximity in qualitative studies.<sup>102</sup> In instances of organizational proximity, we coded any data on individual organizational objectives, rules, and regulations—or any data implying differences between these objectives, rules, and regulations—in order to be able to identify any relevant similarities or differences, in line with previous proximity studies.<sup>103</sup> In order to assess the progress made in open innovation initiatives—and any barriers encountered—we coded indications of the project’s performance according to Rogers’ process of innovation adoption,<sup>104</sup> as the open innovation initiatives we studied can be regarded as adopting rather than generating innovations.<sup>105</sup> Hence, we coded any information regarding activities related to phases of agenda-setting (defining a general problem that creates a perceived need for an innovation), matching (fitting the problem to a specific innovation, a decision that precedes the start of the implementation of the innovation), redefining and restructuring (the process of re-inventing the innovation to accommodate organizations’ needs and structure), clarifying (a process of social construction so that the meaning of the innovation gradually becomes clear), and routinizing (incorporation of the innovation into organizations’ regular activities).<sup>106</sup> We also coded information about the time it took to complete these phases. Similar indicators (time to implement the innovation, process time) are commonly used in studies of innovation processes.<sup>107</sup> Third, we recoded data coded in the first round in order to be able to assess the extent of proximity (recoding segments previously coded as instances of weak or strong proximity) and any progression made through different phases of innovation adoption. Finally, we developed case summaries based on coded data and our interpretation thereof, in which we made a final assessment of the extent of proximity. This entailed evaluating the number of segments coded as weak and strong for a particular proximity dimension in a single case, but also re-examining the content of all of these segments in order to arrive at a final qualitative interpretation of the extent of proximity on any given dimension in each case. As part of this step, we also compared findings across cases.

## Case Studies: Five DemeTalent Initiatives

We compared findings from regional partnerships that either succeeded in using open innovation to adopt the DemeTalent service innovation, partially succeeded to do so, or failed to adopt the service innovation. The five cases we studied are based in five geographical regions: “Oss” (A), “Stichtse Vecht” (B), “Utrechtse Heuvelrug” (C), “Wijchen” (D), and “Hengelo” (E). We provide additional details about the cases and data in Table 2. All partnerships include a great diversity of partner organizations within the local health care value chain (nursing homes, social care or welfare organizations, municipalities, citizens’ initiatives, and the knowledge broker). The case studies document how some of the



**TABLE 2.** Background Information on Cases and Data.

	Region "Oss" (A)	Region "Stichtse Vecht" (B)	Region "Utrechtse Heuvelrug" (C)	Region "Wijchen" (D)	Region "Hengelo" (E)
Municipality Population <sup>a</sup>	91.451	64.336	49.515	40.951	80.683
Number of Open Innovation Partners <sup>b</sup>	5	6	5	5	6
Interviews	6	6	6	6	8
Documents <sup>c</sup>	10	16	16	9	10

<sup>a</sup>CBS Statline, "Bevolking: Geslacht, Leeftijd En Burgerlijke Staat, 1 Januari," 2020, <https://opendata.cbs.nl/statline/#/statline/#CBS/nl/dataset/7461bevt/tables=1590235705893>.

<sup>b</sup>All cases include the social entrepreneur ("knowledge broker"), the total number of partners in all cases is 23.

<sup>c</sup>The database includes 11 additional documents that were not linked to any of the cases in particular. These were either policy documents at the national level or more general documents obtained from the knowledge broker.

more successful partnerships have used proximity to overcome open innovation barriers. On the other hand, initiatives that failed were unable to overcome open innovation barriers due to a lack of proximity (i.e., because of distance). The results suggest that specific interventions related to proximity dimensions may be used to overcome open innovation barriers. We illustrate our findings with segments from interview and document data.

### ***Open Innovation Initiatives Adopting DementTalent***

Success in adopting the DementTalent service innovation varied across regions. Two initiatives (from regions A and D) were identified as being particularly successful in the adoption and implementation of the service innovation. Two other initiatives (from regions B and C) were identified as being on route to success, but had experienced some setbacks. One of the initiatives—from region E—did introduce a new service, but not the DementTalent service innovation, and is therefore regarded as a failure case. All three types of cases are interesting as proximity played a role in the successful or unsuccessful adoption of the DementTalent service innovation, and in overcoming open innovation barriers. In Table 3, we summarize our findings about the adoption of DementTalent in the five cases, and we briefly elaborate on these findings below.

In regions A and D, the phases of restructuring and redefining the service innovation, clarifying the service innovation, and routinizing its use in the local health care value chain were completed or almost completed at the time of data collection. Region A, however, was most advanced in its implementation of the new service. In processes leading up to the launch of the new service, the project partners worked with clients and caregivers to identify the local needs and attune the service innovation to those needs. The DementTalent service innovation (as offered by the knowledge broker) was used as a blueprint, but the region chose to develop additional local elements for the service—for example, it had its own approach to matching clients (i.e., dementia patients) to volunteer work placements in the region. Essentially in parallel to redefining and restructuring the service innovation, this initiative started to clarify the service innovation within the regional value chain, as caregivers and patients were already actively involved. Although the initiative in region D also came a long way in adopting and tailoring the service, it took these partners longer, and there is still some skepticism about the initiative among referrers in the health care value chain. Yet what sets the results of regions A and D apart is that not only the project partners, but also the other stakeholders involved in the complex problem were satisfied with the new service. As one of the interviewees for region A recalled,

A patient's wife told me: "Now I have got my husband back, . . . when he comes home, he has got stories to tell!" Absolutely great. (An interviewee)

Another interviewee in region A recalled what the owner of a local printing firm had said about his experience with the patient who was matched to a volunteer work placement in his business. The firm prints packaging for medical supplies

**TABLE 3.** Adoption of the DementiaTalent Service Innovation.

	<b>A “Oss”</b>	<b>B “Stichtse Vecht”</b>	<b>C “Utrechtse Heuvelrug”</b>	<b>D “Wijchen”</b>	<b>E “Hengelo”</b>
Overall	Completed all phases.	Major progress in clarification, some progress in the other two phases.	Major progress in redefining and restructuring as well as clarification, some progress in routinizing.	Slowly completed redefining and restructuring, as well as clarification, and made major progress in routinizing.	Completing all phases did not result in the implementation of the DementiaTalent service innovation.
Time spent	23 months	19 months	21 months	30 months	18 months
Redefining and Restructuring	The project partners invited caregivers and clients from the start to redefine the DementiaTalent service for the region. This led to the development of so-called matching procedures (where patients are matched with a volunteer working place in society) using visual aids (photo and video) to help patients to better indicate their preferences for a suitable place to work within society.	Although partners shared a sense of urgency regarding the problem and DementiaTalent solution, there was little joint effort to redefine and restructure the DementiaTalent service to suit the local health care value chain. As a result, the service was implemented closely following the ideas put forward by the knowledge broker and project leader, and with the involvement of mostly one other partner.	The project has come a long way in redefining and restructuring the DementiaTalent service for the local system.	The service has been fully tailored to the local needs and it is operational.	Restructuring and redefining resulted in a service that is basically “old wine in new bottles”: Whereas the DementiaTalent service is a new, emancipatory approach to dementia care, the new service offered in Region E simply moved traditional day care facilities from the nursing home to some external, but still highly isolated location. That is, the new service did not create any places for voluntary work within society for people with dementia. Rather, it created yet another location for patients outside of society, albeit more sympathetic (on a farm instead of in a nursing home).

(continued)

TABLE 3. (continued)

A “Oss”	B “Stichtse Vecht”	C “Utrechtse Heuvelrug”	D “Wijchen”	E “Hengelo”
<p>Clarifying</p> <p>Because caregivers and clients were also involved in redefining and restructuring—as were other partners in the local health care value chain—the initiative started processes of clarification in parallel with processes of redefining and restructuring. This saved time and set the stage for a service innovation that would be accepted and used by all stakeholders.</p>	<p>The local project leader set up an impressive PR campaign. Phased press releases were issued for the local press supplemented with interviews with experts, a professional brochure was distributed, and the two large information meetings (Alzheimer Cafés) were held in the two largest, local community centers; exposure was generated at six existing local conferences and consultations, websites of the municipality and care organizations published information on DemenTalent, local ambassadors were recruited, and active contact was made with dementia case managers, a volunteer center, schools, sports clubs etc.</p>	<p>The new service has been introduced and clarified to all partners in the local health care value chain using the usual channels (e.g., Alzheimer Cafés). Yet among some local partners there is skepticism in referring patients to the new service; the project has been called “the umpteenth project.”</p>	<p>Clarification of the new service along the local health care value chain was successfully completed. The basic proposition of the service was essentially the same as that of existing services.</p>	<p>Clarification of the new service along the local health care value chain was successfully completed. The basic proposition of the service was essentially the same as that of existing services.</p>

(continued)

**TABLE 3. (continued)**

	<b>A “Oss”</b>	<b>B “Stichtse Vecht”</b>	<b>C “Utrechtse Heuvelrug”</b>	<b>D “Wijchen”</b>	<b>E “Hengelo”</b>
Routinizing	The project has been routinized in terms of standardizing and continuously improving the working methods, handling referrals and guidance of caregivers and patients, and the project has obtained structural funding by the municipality. The health care service innovation is operational in this region, and it has placed ten dementia patients since.	This project is still financially dependent on temporary municipal subsidies. The municipality has expressed that they believe a longer process of adoption and gradual cultural change for professionals to become accustomed to using the service is needed. Seven patients have been placed, five placements are pending.	Financing of the project is still on temporary basis, and there is no perspective of financial support becoming structural any time soon. Furthermore, problems are encountered with regard to the operational collaboration among the partners (getting referrals to the service). The service has placed seven patients so far.	The project is structurally guaranteed of financial backing for it to be continued in the long run. However, despite its 30-month long period of implementation, there is still room for improvement in securing referrals of eligible patients to the service. Six patients have been placed so far.	This region has a (slightly) better functioning referral system for patients than other regions. This can, however, be attributed to the major similarities of the new service to existing services that professionals were used to refer to already. Not surprisingly, the original partners from the project that were excommunicated have now reinvigorated the original emancipatory idea for the service innovation in another project, basically starting the adoption process anew.

and it is very important to the firm's clients that there are no inaccurate prints. At first, the business owner had been reluctant, explaining that it would be difficult to employ a dementia patient as the volunteer might make unfortunate errors in the prints because of his disease. Yet following a six-month evaluation period, the owner had to admit that—to his surprise—he had been wrong:

Sure, we do have to check all of his work, we must, because there simply cannot be any mistakes. However, we did not find any errors yet. Not a single mistake in six months! (Project leader quoting the business owner)

At the time of data collection, partners in regions B and C were certainly not dissatisfied with the progress their initiatives had made in the process of adoption. Both initiatives had made considerable progress in at least one phase of innovation adoption, but had also faced setbacks in one or two other phases of adoption. In region B, partners reported that many steps had been taken in terms of clarifying the DemenTalent service among the partners and other stakeholders. Both the project leader and a civil servant pointed out that this resulted in a clear understanding of the need, use, and relevance of the new service:

Everyone thinks it is great. (Project leader)

Whatever they have encountered, that also plays a role in that. In that sense, DemenTalent is really important. The taboo that just always clings around dementia . . . . In the first phase it turned out, and that was true for all those partners . . . how excited that everyone was about the entire DemenTalent concept, it was not the case that . . . candidates stood in line saying “oh yes, we want to participate in that.” No. And that also has to do with that taboo. It is bad enough, people still have to stick their necks out, be visible and say “look, I have Alzheimer's.” (Civil servant)

Yet despite this shared sense of urgency, the process of redefining and restructuring the service innovation closely followed the blueprint offered by the knowledge broker for the DemenTalent service innovation. There was relatively little joint effort by partners and other stakeholders to tailor the service to the local context. Interviewees linked this to subsequent setbacks in securing the finances that would allow them to continue implementing the service in the long run. In region C, the service innovation had been adapted to local needs and clarified using channels recommended by the knowledge broker (e.g., arranging information meetings called “Alzheimer Cafés”), but had not yet obtained structural financial backing from the municipality or other partners, nor the commitment of referrers (so-called dementia case managers). The latter are reported to have argued the project to be “the umpteenth project” (project leader).

In region E, a new service for dementia patients was introduced. Here, a select group of original project partners excluded the other project partners at some point during the adoption process. They then started a citizens' initiative and continued to source a new location for dementia patients to participate in day



care activities. The new location was definitely more sympathetic and inviting to these patients than traditional day care was, as it was set on a farm rather than in a nursing home, where all patients could participate in activities of the farming business. However, other than this, the new service was basically “business as usual,” meaning that the partners reverted to the age-old approach of providing day care activities in a secure location, outside of society, and with limited tailoring to the individual patient. Other than the location, the new service did not exhibit any of the characteristics of the DemenTalent service, which aimed to match patients to a volunteer work placement within an actual business or organization, based on the patient’s specific interests and background. Therefore, despite the fact that all phases of adoption had been completed, leading to the launch of a new service, we concluded that region E had been unsuccessful in adopting the DemenTalent service innovation. A representative for the citizens’ initiative agreed,

Here, things are not running in the way the DemenTalent service was supposed to.  
(Citizens’ initiative representative)

### ***Using Proximity to Overcome Open Innovation Barriers***

Core partners in each of the open innovation initiatives were diverse and included nursing homes, the knowledge broker, social welfare organizations, and municipalities. Furthermore, in all regions, the core partners also collaborated with partners for the placement of dementia patients, such as museums, landscaping organizations, farming businesses, and schools; other partners from the health care value chain (local hospitals, family doctors,<sup>108</sup> district nursing organizations); and in certain instances, the caregivers and patients themselves. Hence, beyond the core partners, many other stakeholders were somehow involved in or affected by these initiatives. Despite the initiatives having to deal with this amount of partner diversity, and the complex nature of the problem the service innovation was designed to solve, we can see that two out of the five regions made considerable progress in the adoption of the new service. Only one of the regions failed to adopt the service innovation. Of interest to us, then, was how some of these regions successfully dealt with complexity when introducing the innovation, and why others could not.

In order to understand the role of proximity in overcoming with open innovation barriers in complex projects, we first describe the extent of proximity observed in each of the cases (presented in Table 4). Next, we illustrate how four dimensions of proximity helped partners to overcome their differences, and how a lack of proximity meant one initiative ran into considerable open innovation barriers.

*Organizational proximity.* The case studies show that having some organizational proximity helps partners to set aside any potential reasons for them not to collaborate. As seen in Table 2, regions A and D were rather successful in the adoption of DemenTalent. This was the case despite tensions and differences arising

**TABLE 4.** Proximity in the Open Innovation Initiatives.

	<b>A “Oss”</b>	<b>B “Stichtse Vecht”</b>	<b>C “Utrechtse Heuvelrug”</b>	<b>D “Wijchen”</b>	<b>E “Hengelo”</b>
Organizational Proximity	<i>Strong</i> —The partners share a sense of urgency regarding the problem of treating dementia effectively and at acceptable cost, despite continuous increase of the number of patients. They work closely together to attain this goal.	<i>Weak</i> —The partners share a sense of urgency regarding the problem of treating dementia effectively and at acceptable cost, despite continuous increase of the number of patients. However, some local partners felt their objectives did not align with those of the knowledge broker (entrepreneur).	<i>Weak</i> —The partners share a sense of urgency regarding the problem of treating dementia effectively and at acceptable cost, despite continuous increase of the number of patients. Some partners felt their organizations' goals were different from those of local case managers, and some local partners felt their objectives did not align with those of the knowledge broker (entrepreneur).	<i>Moderate</i> —The partners share a sense of urgency regarding the problem of treating dementia effectively and at acceptable cost, despite continuous increase of the number of patients. Some partners are concerned about sacrificing some of their individual strategic interests, and felt their organizations' goals were different from those of local case managers.	<i>Very Weak</i> —The partners have comparable missions (effective dementia treatment at acceptable cost for a growing population of patients), but different ideas about time horizon and approach to adoption. Over time there was a divide in the partnership: (a) a citizens' initiative working closely with the welfare organization on the project and (b) the knowledge broker, the larger health care organization, and the municipality, the three of whom were excluded from the project. The citizens' initiative wanted to be able to operate independently from the large health care organization.

(continued)

**TABLE 4. (continued)**

	<b>A “Oss”</b>	<b>B “Stichtse Vecht”</b>	<b>C “Utrechtse Heuvelrug”</b>	<b>D “Wijchen”</b>	<b>E “Hengelo”</b>
Cognitive Proximity	<p><i>Strong</i>—The partners share academic or higher vocational education, with many individuals having ten+ years of experience in (elderly) health care. Furthermore, many of the partners either had education in dementia care or direct experience with dementia care.</p>	<p><i>Moderate</i>—The partners share academic or higher vocational education. Yet individuals’ years of experience are very diverse, ranging from very limited years of experience to lifelong careers in the field. Some of the partners have no prior education or experience related to dementia care. However, they were encouraged to seek collaboration with a local dementia expert.</p>	<p><i>Moderate</i>—The partners share academic or higher vocational education, and have a relatively similar amount of experience in the field. Some of the partners have no prior education or experience related to dementia care.</p>	<p><i>Strong</i>—The partners share academic or higher vocational education, and have a relatively similar amount of experience in the field. Some of the partners have no prior education or experience related to dementia care. However, they sought closer collaboration to local dementia experts to make up for this.</p>	<p><i>Weak</i>—The partners differ considerably in their level of education. It ranges from the academic level, to the higher vocational level, as well as lower vocational level. There were several partners with less than five years of experience in (elderly) health care, and no partners with over ten years of relevant experience. Several had both experience with and knowledge of dementia care. However, partners from the citizens’ initiative had no prior professional experience in or knowledge of dementia care. These partners participated in trainings in order to acquire the relevant knowledge. Yet from their personal experience and the trainings they obtained very different ideas about the nature of the solution that should be in place; in their view it should (still) be traditional kind of daycare.</p>

(continued)

**TABLE 4. (continued)**

	<b>A “Oss”</b>	<b>B “Stichtse Vecht”</b>	<b>C “Utrechtse Heuvelrug”</b>	<b>D “Wijchen”</b>	<b>E “Hengelo”</b>
Social Proximity	<i>Moderate</i> —Partners had little previous experience with one another prior to initiation of the initiative. Yet kick-off events quickly led to the development of trust among partners. During the project, all partners had frequent contacts. Partners report considerable trust amongst them.	<i>Strong</i> —Partners had considerable previous experience with one another. During the project all partners had frequent contacts. Partners report considerable trust amongst them.	<i>Strong</i> —Partners had considerable previous experience with one another. During the project all partners had frequent contacts, although there was less contact with the knowledge broker. Partners report considerable trust amongst them.	<i>Strong</i> —Partners had considerable previous experience with one another. During the project all partners had frequent contacts. Partners report considerable trust amongst them.	<i>Weak</i> —A small number of partners had considerable previous experience working together, other partners were newly introduced to one another in light of the project. In-groups of partners developed over time. Out-group partners, including the knowledge broker, in the project were excommunicated by in-group partners. Between in-group and out-groups partners there is significant distrust. Family, friendship and neighborhood ties were the basis of one of the in-groups: the citizens’ initiative and welfare organization.
Personal Proximity	<i>Strong</i> —There was an evident “click” between individuals working for all project partners. Particularly between representatives from the care organization, welfare organization, and knowledge broker, who were supported by the municipality’s civil servant.	<i>Moderate</i> —The local project leader of the welfare organization and the care providers at two health care organizations got along very well. Yet the local project leader could not get along particularly well with another care provider at a third health care organization.	<i>Weak</i> —Several individuals “clicked” in this initiative: (a) the local project leader and the knowledge broker and (b) a social worker and civil servant. Yet the project leader and the social worker had their personal differences, according to one of them.	<i>Moderate</i> —The local project leader, the manager of the health care organization, the knowledge broker, and a civil servant all got along quite well. Interviewees reported a “disclick” between various individuals and the manager at another health care organization that partnered in the project.	<i>Very Weak</i> —The same in- and out-groups displayed clicks between individuals within the groups and disclicks between individuals from different groups.

between partners and despite the wickedness of the problem at hand. For example, an organization in region A faced urgent strategic issues and had to reduce their resource allocation to the project, but maintained their commitment to the project nonetheless. A pending merger also meant that the attention of one of the organizations was temporarily diverted away from the initiative, but they chose to support the initiative regardless. In region D, partner organizations worried that their existing services (providing traditional day care) would suffer as a result of the initiative, and even expressed a fear that it would lead to cannibalization of existing day care facilities in their organization (clear signs of the OUH syndrome). Yet organizational proximity helped them to overcome their differences, because even though the strategic objectives of the partner organizations are diverse, and even though the partners each serve the interests of different types of stakeholders and weigh these interests differently, there was one important common denominator in these cases. That is, all partners felt and expressed the strategic urgency of finding solutions to the problem at hand—that is, the need to continue to treat dementia patients affordably and effectively despite the fast-paced growth of the number of dementia patients. Each of them recognized that this required them to work with diverse partners. Furthermore, the local organizations involved shared a vision on how the problem should be tackled. Documents from region A illustrate the way in which organizational proximity, at least in terms of sharing a common mission and vision, was helpful when it came to setting aside organizational differences:

Considering the fast-growing group of dementia patients living independently, at home, there is a need to have robust support for these types of patients. (Municipal policy document)

Collaborating with each other, the client, caregivers, and other stakeholders is obvious. Yet “together” also implies working with other organizations, ranging from welfare organizations to football clubs. (Five-year strategy document of a local care organization)

*Cognitive proximity.* Several initiatives (in regions B, C, and D) that succeeded in adopting DemenTalent, or were well on their way to doing so, are also regions in which individual partners came from quite diverse backgrounds. Due to the complex nature of the problem, a great diversity of organizations was involved in the service innovation. This meant that, from the outset, not all partners were trained or experienced in dementia care (or even health care in general). However, in two of these initiatives, we observed that individual partners or partners together took action to minimize or bridge such differences between them. In region B, one partner with a background in marketing and business administration was asked by the other partners to collaborate more closely with a local dementia expert in order to gradually acquire a better understanding of ways of working common to the field, as well as a better understanding of the disease. In region D, one project manager had a background in literary sciences, and hardly any knowledge of dementia or elderly care. She therefore sought a close collaboration with a colleague who had greater professional experience with dementia:

I had a frequent sparring partner in [person's name] from [a local care organization] . . . . This was mostly case-related and she also had ideas on how to deal with elderly and dementia patients. (Project manager welfare organization)

Both cases illustrate how these sorts of informal mentoring relationships can be established between individual partners, in order to nurture cognitive proximity between them (assuming that increasing cognitive proximity would benefit the adoption process). Interestingly, a similar experience of cognitive distance was reported in region C. However, partners involved in this initiative made no attempt to increase their cognitive proximity. Respondents in regions B and D both described how the gradual build-up of cognitive proximity was associated with specific progress they were able to make in the adoption of DementAlent. Regarding region D, for example, the knowledge broker recalled that because cognitive proximity grew over time, the municipality was willing to be more actively involved, and eventually made arrangements for financial support to be available long-term. The only other region in which partners were willing to financially commit to the service in the long run was region A:

To get things going, [the civil servant] is a prime example of that . . . I knew her from before, and also knew that one of her parents had suffered from dementia . . . that really makes a difference. (Knowledge broker)

*Social proximity.* Social proximity helped partners in regions B and C to make important advances in restructuring and redefining the service innovation, as well as in clarifying it. In region B, the project leader was successful in clarifying the new service to all kinds of stakeholders in the local health care value chain. This was because she was able to access these organizations via particular individuals in her local social network. As a result, via the project leader, the partners in this initiative were better embedded in relevant local networks. In fact, this was also how the region's DementAlent initiative was initiated in the first place. The project leader happened to run into a local government councilor at a social event. While they were already acquainted, it was only during this meeting that she became aware of the councilor's personal interest in dementia, as the project leader recalled,

Before I knew it, I had another meeting with her, our organization's manager at the time, and a civil servant . . . . I had also asked the knowledge broker to join . . . . They told us that our initiative would be eligible for an incentive fund, but only if we could write up our plans within the next 10 days. (Project leader)

According to the knowledge broker, this is also how the restructuring and redefining then took place:

[Health care organization employee] is taking the lead in that. She is the one trying to create working places, active in those kinds of activities . . . . You know, she was just asked, by the project leader [who knew her], whether she wanted to



share her thoughts on the project. And she, [health care organization employee], she just jumped right into it and really dug in. (Knowledge broker)

Region C saw two partners open their social network to one another in order to reach as many potential local stakeholders as possible to clarify the new service innovation. Individually, the partners had very different kinds of contacts, including their organizations' obvious stakeholders. However, these partners already knew each other in a professional capacity, and therefore felt comfortable sharing information about potential stakeholders of the service. In this way, it was possible to approach not only the obvious stakeholders in the local health care chain (e.g., family doctors, the hospital, and dementia case managers), but also multiple places of work (regarding potential volunteer work placements), including the local branch of a large bank, a local supermarket, several local non-profit organizations, a thrift store, a children's day care organization, and local churches. It was also beneficial to this project that the social worker at a welfare organization and the civil servant were socially close, as they had worked together in a professional capacity for some time. In summary, there was social proximity between several partners in this project, and between partners and relevant local stakeholders, which enabled partners to effectively and widely clarify the new service.

*Personal proximity.* Personal proximity was used in region A to deal with partners' relatively limited embeddedness in the same networks. Many of the partners in region A did not have (extensive) previous experience working with one another, but when the initiative started it was immediately clear that partners in the project identified with one another on a personal level. In contrast to the other case studies, there were no reports of dislike among partners, but rather there were obvious signs that partners shared personal beliefs and a desire to solve the problem at hand. The following quote from one of the region's civil servants illustrates the strength of the personal proximity between several of the individual partners:

[Partner A] got along with [Partner B]. They were close . . . but I felt the same connection with [Partner A], even though we did not have very frequent contact. This is because you simply recognize in a person, and—by the way—this applies to [Partner C] as well, that even though we are quite different types of people, we share this drive. Commitment, a desire to get somewhere. When you see that with someone else, instantly you feel 'this is okay, this is good, we are going to make something out of this.' (Civil servant)

*A lack of proximity.* Proximity played a clear role in four of the regions, with regard to partners' ability to overcome barriers and leverage their differences to the benefit of solving the wicked problem. However, in region E, proximity was essentially absent. In other words, the partners in region E were rather distant on all four dimensions of proximity. Whereas we observed partners successfully circumventing typical open innovation barriers in all other regions where partners were proximate, in region E we observed partners running into these pitfalls

with eyes wide open, and subsequently failing to adopt DemeTalent. Firstly, partners in region E were not organizationally proximate. While several original partners were seeking to introduce the innovation as soon as possible, the larger health care organization could not immediately accommodate working at that speed due to internal changes of management. Wanting to waste no time, and convinced going solo gave them more flexibility in developing the new service, the original partners who eventually started the citizens' initiative chose to operate independently of the larger health care organization. Accordingly, among the partners, we found evidence of clear attitudinal barriers, but also managerial barriers related to maintaining external relationships:

We did explore whether we could draft a joint project plan, but could not get support of all partners. We started to focus on our own development and growth.  
(Project leader of the citizens' initiative)

On top of this, partners were not cognitively close in this region, and we found clear indications of both NIH syndrome and ASH syndrome. Partners associated with the citizens' initiative shared a conviction that the emancipatory approach guiding the DemeTalent service (that the other partners subscribed to) simply would not work in their region. They had experienced first-hand the prejudice surrounding the disease. In their view, and because of their cognitive background, matching patients to a volunteer work placement in society would simply not be possible. They were thus not open to accepting a departure from the secure character of existing day care services (this being precisely what the other partners called for). Furthermore, rather than consult the DemeTalent partners to learn about this novel approach to dementia day care, they sought inspiration from examples in other regions that more closely followed their own view of what would constitute appropriate new day care services. The cognitive distance between various partners was mentioned by many of those involved:

In that respect the system of DemeTalent will not work in this region . . . . Particularly toward businesses. When a customer walks in, and you happen to have a dementia patient in your store not having their best moment, what would you do? I know it sounds very black-and-white, but it is something to account for.  
(Citizens' initiative representative)

They are such different types, of the sort who prefer [the patients to spend their time] knitting . . . . Sure, this may be my prejudice, but really their approach is much more caring, in vein of "oh, how nice is it to have all these people here," a little . . . . patronizing . . . . I was often caught in the middle before. With these partners . . . . [manager of a large health care organization] would say "we want to go this way" and [project leader of the citizens' initiative] would say "but we would like to go that way," and they just could not understand each other. (Knowledge broker comparing the two groups of partners)

Region E's original group of project partners consisted of individuals who were not all previously embedded in the same network. Several partners had existing

ties, but others had been newly introduced to the project. There were some existing ties among these newly introduced partners themselves, however, as they were part of a network of family, friends, and neighbors. The different groups of partners never really succeeded in bridging the social distance between them—instead creating (or rather maintaining) in-groups and out-groups. This case illustrates how these in-groups and out-groups can hamper the process of clarifying and routinizing a new service. The project leader of the citizens' initiative did try to address the OUH syndrome evident among the other group of partners toward their own group (which became apparent when the citizens' initiative had trouble getting funds for their service because of social distance):

When we then asked about the funding decision, during an evaluation: “Why is it that our initiative was not funded?” We did get some good feedback, but they also said: “Well, you are just not a part of the dementia chain.” When we replied saying: “How come we are not part of that chain?” They answered: “Because we do not invite you to be.” Then I said: “Well that’s a bit of a vicious circle.” (Project leader of the citizens' initiative)

In sync with the partners' inability to increase organizational, cognitive, and social proximity, all kinds of personal-level tensions arose over time, which only served to emphasize the other differences between the partners and to amplify the resultant barriers. Examples of how the original partners characterized each other based on their unsuccessful joint experiences include “distant . . . driven by personal gain” and “reserved . . . withholding” (citizens' initiative representative about another partner) and “exploitative . . . showing different faces” (knowledge broker about another partner). Partners were keen to place themselves in a better light than other individuals during the interviews.

## **Discussion: Proximity as a Source of Success and Failure**

Our results on the adoption of a health care service innovation across five regional initiatives are informative about how proximity enables partners to be successful in open innovation. Based on these results, we propose that proximity dimensions can help partners to leverage their differences or to set aside their differences. Yet we also argue that at low levels of proximity, partners may struggle to work together well, to the detriment of open innovation outcomes.

### ***Proximity as a Source of Success or Failure***

We infer from the case studies that each individual dimension of proximity can be a source of success or failure when it comes to open innovation. In general, this is in line with our study's overall initial proposition in Figure 2. Our findings suggest that while proximity can help to overcome barriers or even leverage differences, a lack of proximity allows for barriers to arise and persist. In regions where there was relatively weak proximity on one or two dimensions, we observed minor setbacks in innovation adoption by the project partners. At the same time, we also observed progress in innovation adoption that was

attributed to stronger proximity on other proximity dimensions. Regions B and C showed some signs of organizational distance and personal distance between specific partners, and both also reported problems in routinizing the service innovation—that is, in securing structural financial commitments to the service. On the other hand, we see that in the same regions, having relatively strong cognitive proximity and social proximity was linked to successes attained in phases of restructuring and redefining and/or clarifying. The case studies also point to the notion that, interactively, the proximity dimensions may be even more strongly associated with success or failure. This follows from the finding that, in regions where we observed moderate to strong proximity on *all* proximity dimensions, we observed successful innovation adoption (regions A and D), whereas in regions where we observed weak to very weak proximity on *all* proximity dimensions, we observed failure of innovation adoption (region E). These findings are in line with previous studies and reaffirm the notion that proximity dimensions may act as each other's substitutes (as distance on a maximum of one or two dimensions is not associated with a failure of the projects), and the idea that proximity dimensions may overlap to the benefit of innovation (proximity on all dimensions is associated with success of the projects) or to the detriment of innovation (distance on all dimensions is associated with failure of the projects). The co-existence of substitution and overlap effects has been identified in several previous empirical studies about specific combinations of proximity.<sup>109</sup> The current study adds to these insights by illustrating that the overlap effect goes above and beyond the substitution effect.

### ***Linking Proximity Dimensions to Specific Open Innovation Barriers***

We can also infer from the case studies that specific proximity dimensions constitute a means to overcome specific open innovation barriers. All of the four investigated proximity dimensions were linked to specific barriers to open innovation in our results, thereby allowing us to get an in-depth and more refined understanding of our initial proposition in Figure 2. We present a summary of these links in Table 5. In the three cases where *organizational proximity* was relatively weak, our results regarding innovation adoption showed mixed progress in the implementation phases, implying that barriers may have been encountered. Specifically in relation to organizational proximity, we identified issues related to the partners' management of external relationships and internal organizational changes,<sup>110</sup> reluctance of certain organizations and individuals to make increasing use of the service innovation (which is rooted in the NIH syndrome), and a fear of strengthening the competitors' position at the expense of the organization's own existing internal services for dementia patients (OUH syndrome). *Cognitive proximity* clearly featured as a way of dealing with NIH syndrome and ASH syndrome. That is, partners were reluctant to redistribute responsibilities in the dementia care chain to other (sometimes new and inexperienced) partners or to partners with different views on appropriate therapies. Yet they grew more comfortable in doing so as they sought ways to build cognitive proximity. *Social proximity* appears to be associated with well-known managerial problems in open

**TABLE 5.** Proximity Dimensions, Open Innovation Barriers, and Management Interventions.

Proximity Dimensions	Related Barriers	Interventions and Remedies
Organizational	Management of external relationships, management of internal changes, NIH syndrome, OUH syndrome	<ul style="list-style-type: none"> <li>• Identify a common goal <i>or</i> select partners that share a common goal</li> <li>• Select a common goal urgent to all of the organizations, so that it survives amongst the other strategic interests of the individual organizations</li> <li>• Link this common goal to the wicked problem at hand</li> <li>• Continue to promote the common goal during the open innovation initiative</li> </ul>
Cognitive	NIH syndrome, ASH syndrome	<ul style="list-style-type: none"> <li>• Use mentoring practices to increase cognitive proximity: <i>learning on the job</i> from other partners in the initiative</li> <li>• Offer (individual) partners education and training to increase cognitive proximity: <i>learning about the job</i> from outsiders—note that some dimensions of cognitive proximity (e.g., ways of working, know-what) may be easier to grow than others (e.g., know-how)</li> </ul>
Social	Internal commitment of partner organizations, inertia, OUH syndrome	<ul style="list-style-type: none"> <li>• Be mindful of the selection of socially distant partners into the initiative, as it may result in the formation of in-groups and out-groups</li> <li>• Organize social events with partners and other stakeholders to build social proximity or to activate existing ties</li> <li>• Identify and use existing network ties between partners to increase the likelihood that all partners will make a commitment to the initiative based on trust</li> <li>• Use social proximity to partners to gain wider reach to stakeholders who are socially close to those partners</li> </ul>
Personal	NIH syndrome, OUH syndrome, ASH syndrome, management of external relationships	<ul style="list-style-type: none"> <li>• Try to identify existing “good” and “bad” individual-level relationships</li> <li>• Assign roles/activities in the phases of adoption to individuals who have “good” relationships</li> <li>• Try to improve “bad” relationships, for example, by having the individuals experience joint success</li> </ul>
Overlap of proximity dimensions	All of the above	<ul style="list-style-type: none"> <li>• Try to prevent partners from growing distant on all dimensions over time; distance on all dimensions renders partners unable to overcome open innovation barriers</li> <li>• Try to grow proximity on all dimensions over time; proximity on all dimensions allows partners to overcome and leverage any differences</li> </ul>

Note. NIH = Not-Invented-Here syndrome; OUH = Only-Used-Here syndrome; ASH = All-Stored-Here syndrome.

innovation, such as issues related to the commitment of (internal) management and issues related to sustaining this commitment,<sup>111</sup> organizational inertia,<sup>112</sup> and a sort of favoritism indicative of the OUH syndrome. *Personal proximity* was clearly associated with the success attained in region A (where personal proximity was relatively strong), and it was also associated with signs of the various attitudinal syndromes and problems related to managing external relationships in regions where it was considerably weaker.

## Managerial Implications

Society faces many wicked problems today. Many of these problems relate to grand societal challenges, such as the transition to sustainable energy and CO<sub>2</sub>-neutral mobility in light of climate change, the threat of terrorism, or the question of how to cope with the growing global population. Yet there are also firm-specific wicked problems, such as fast firm growth,<sup>113</sup> or industry-specific wicked problems, such as revitalizing an industry that is near the end of its life cycle. On the one hand, all of these problems pose a challenge to organizations. Managers of public or private organizations face the daunting task of defining problems that exhibit many characteristics of wickedness and then seeking solutions to those problems, while trying to align stakeholder interests as best they can and experimenting with solutions that may turn out to have adverse effects that they could not have anticipated. Managers in well-established companies may therefore see the business positions they so successfully exploit endangered by wicked problems or by others' attempts to solve those problems. On the other hand, wicked problems also constitute a major opportunity. From a policymaker's perspective, knowing how to find at least a provisional solution to a wicked problem is better than not having a solution at all, particularly considering the urgent nature of some wicked problems—or the severe consequences of these problems.<sup>114</sup> Entrepreneurs or managers may also frame wicked problems as a strategic opportunity to explore new business rather than as a strategic threat.<sup>115</sup> We hope that our findings will contribute to this process and that these managers will find themselves better equipped to solve these problems than before.<sup>116</sup>

The present study elucidates how managers can use open innovation as a collaborative strategy in order to effectively solve complex or even wicked problems. Managing openness between the various types of partners involved in solving complex or wicked problems, or stakeholders with an interest in such problems, is not easy. Open innovation strategies not only provide organizations with the practices they need to be able to define the problem and find a solution, but also to align the interests of those involved and to create room and acceptance for learning and experimentation. We recommend that partners using open innovation to solve complex or even wicked problems look to the proximity framework in order to identify interventions they can use to leverage proximity to their advantage, or to set aside proximities that cannot be leveraged to the benefit of the open innovation initiative. To understand the range of interventions that managers can choose from,

it is important to recognize that proximity is dynamic.<sup>117</sup> Hence, proximity between partners can increase or decrease over time, either naturally or as a result of targeted intervention. From our case studies, we identified several potential management interventions and remedies. Table 5 offers managers an overview of interventions related to specific proximity dimensions, as well as those related to an overlap of proximity dimensions. It also identifies the open innovation barriers we were able to link to specific proximity dimensions.

## Conclusion

Earlier studies have demonstrated that open innovation is particularly suited to generating and adopting innovation for complex and wicked problems, as well as to developing innovations that require the involvement of diverse partners.<sup>118</sup> However, others have pointed out that, by their very nature, complex and wicked problems are also much more demanding of management processes and practices dealing with openness.<sup>119</sup> Building on this work, we developed a proximity framework that points to specific interventions that can be used to better manage openness in such a context. We studied five open innovation initiatives adopting a particular health care service innovation. Our data show that variations in proximity between partners are related to their ability to overcome open innovation barriers, and their ability to adopt the service innovation despite the complexity of the problem at hand. Managers faced with open innovation for complex problems can use the proximity framework to find remedies to open innovation barriers that are likely to occur under these circumstances, or better yet, find ways to leverage such difficult circumstances to their advantage.

## Appendix

### *The Dutch Elderly Care System and the DemenTalent Service Innovation*

The Dutch health care system is based on several related health care acts, the most important of which is the 2006 Health Insurance Act. This act created a system of regulated competition based on three principles: “access to care for all, solidarity through medical insurance (which is compulsory for all and available to all) and high-quality health care services.”<sup>120</sup> Approximately half of the funding for this system comes from income-dependent premiums collected from employers by the government, which is invested in the health care system by either the national government or local municipalities. The other half of the funding comes from premiums collected by private insurers who negotiate annual access rights for their consumers to local health care providers (such as hospitals, general practitioners).<sup>121</sup> A large part of Dutch health care is therefore organized in local health care value chains.

The population of the Netherlands was approximately 17.4 million in 2019 with over 824,000 of these inhabitants aged 80 and older.<sup>122</sup> The number of elderly individuals (80 and older) is expected to double by 2040 and triple by



2053.<sup>123</sup> In this respect, the demographic development of the Dutch population follows a global trend of increasing life expectancy and increasingly lengthy socially and economically productive lives.<sup>124</sup> Considering the rapid aging of its population, the country's national government has set itself a paradoxical objective. It aspires to improve the quality of elderly care (by means of personalization, ensuring the availability of sufficient qualified health care staff, and innovation) while trying to keep elderly care cost-effective.<sup>125</sup> Elderly care in the Netherlands is organized at the local level. It typically involves the municipality, local nursing homes, district nursing firms, general practitioners, and social and welfare organizations, to name but a few. In order for the health care system to be cost-effective, a considerable amount of care responsibilities is also allocated to informal (unpaid) caregivers (e.g., family, friends) caring for patients living at home.

The problems associated with Dutch elderly care in general also apply to dementia care in particular, as the country's current number of dementia patients (270,000) is expected to increase by an additional 13,000 new patients every year.<sup>126</sup> In order to effectuate the national elderly care policy for dementia patients, a great number of organizations have partnered in a national cooperative to develop and implement the so-called "Deltaplan Dementia." This cooperative unites firms, universities, patient collectives, government bodies, health care organizations, municipalities, and others in order to coordinate research about dementia, to improve dementia care, and to create a "dementia friendly" society.<sup>127</sup> One of the initiatives supported by the program is the DemenTalent service innovation. This novel therapy for dementia patients was originally developed by two social entrepreneurs (Bureau DAZ) and is an award-winning concept.<sup>128</sup> Although the concept of treating dementia patients in day care services and meeting centers is not new, this new service calls for a shift in perspective. Dementia patients using this new service are no longer treated in secured areas of nursing homes, or in other purpose-built locations outside of society, but get to choose a volunteer work placement within society that meets their own individual interests and needs. As part of this work placement, they can carry out activities that allow them a prolonged and more complete utilization of their own abilities.<sup>129</sup> This new approach is expected to have positive effects on the patients' health and well-being.

The benefits of the service innovation are supposedly not limited to the health and well-being of the dementia patients. There are also several advantages that relate to the policy objectives for Dutch elderly care. For example, having a volunteer work placement prolongs the economically productive lives of the patients, any informal caregivers involved are emotionally and practically disburdened (e.g., they may be able to take on larger jobs themselves). This also benefits health care organizations (e.g., these patients take up less of the capacity of nursing homes). Indeed, DemenTalent's medically effective and cost-effective approach has been favorably compared to more traditional services in a recent study.<sup>130</sup> The principal investigator in that study was quoted as saying: "I am hopeful for a domino-effect, via which DemenTalent will spread throughout the Netherlands."<sup>131</sup>

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