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Collaborating for social innovation in public services: inside the black box of public service innovation networks for social innovation (PSINSIs)*

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Résumé

This paper is given over to “Public Service Innovation Networks for Social Innovation” (PSINSIs), a multi-agent structural arrangement set up for the collaborative production of social innovation in public services. It begins by putting forward an analytical framework that makes it possible - from both the morphological and the functional points of view - to distinguish PSINSIs from other expressions of the innovation network concept. Then, using a rich set of empirical material collected within the Co-VAL European research project and consisting of 24 in-depth PSINSIs case studies undertaken in five European countries, it attempts to enter the black box of PSINSIs in order to better understand both the nature of social innovation at work and the modes of formation and functioning of these networks.

Mots clés : innovation networks, public services, social innovation

Introduction

Social innovation is an umbrella-concept characterized as much by its great success as by the persistent fuzziness of its definition. It is generally agreed that this is an innovation that is social in its “means and ends”: a collaborative innovation whose objective is to improve quality of life for individuals and communities, introducing social justice and respect for the environment, rather than to maximize profit (Pol and Ville, 2009; Mulgan *et al.*, 2007; Moolaert and MacMallum, 2019; Gallouj *et al.*, 2018; Djellal and Gallouj, 2012). Social innovation covers all socio-economic activities, whether market-based or not. However, this article is devoted to social innovation in the field of public services (or services of general interest), targeting the so-called “wicked” complex human problems (aging, environmental issues, etc.) that demand collaborative systems. In other words, this paper focuses on what Desmarchelier *et al.* (2020a, 2020b) call “Public Service Innovation Networks for Social Innovation” (PSINSIs).

If only because social innovation is often, by definition, both an innovation produced in a network and a network innovation, these networks are nothing new as operational arrangements. Indeed, this collaborative or network dimension of social innovation is

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considered not only a characteristic of how social innovation is produced, but a fundamental element of its nature and definition (O’Byrne *et al.*, 2014; Ziegler, 2017; Vickers *et al.*, 2017). What is new about these networks is that they are now being taken into account (or taken seriously) by academic research and public policy. From a theoretical point of view, it can be said that the PSINSI concept is the ultimate declination of the innovation network concept, following a double trajectory (or logic) of *tertiarization (or servitization)* and *de-marketization*.

Using a rich set of empirical material collected within the Co-VAL European research project and consisting of 24 in-depth PSINSIs case studies undertaken in five European countries, this article attempts get in the black box of PSINSIs in a bid to better understand both the nature of social innovation at work and the structure, the modes of formation and functioning of these networks.

The article is organized into three sections. In the first section, we discuss, from a theoretical point of view and based on the existing literature, how the notion of innovation network is enriched by a two-fold shift in analytical focus: from manufacturing to services (tertiarization or servitization of the concept) and from market to non-market and social spheres (de-marketization of the concept). The notion of PSINSI is thus discussed in relation to other expressions of the notion of innovation network. In this section, particular attention is paid to analyzing what constitutes the purpose of PSINSIs - namely social innovation. Section 2 is devoted to the presentation of the research methodology. Section 3 and 4 are given over to a presentation and discussion of the 24 PSINSIs collected within the Co-VAL project. We focus in particular on the analytical variety of the types of social innovations implemented (section 3) and discuss the morphology and the modes of formation and functioning of the corresponding networks (section 4).

1. Tertiariation and de-marketization of networks: from TINs to PSINSIs

Among the 20 advances in “innovation studies” (or in science policy) of recent decades, Ben Martin (2015) mentions the shift “from individual actors to systems of innovation”. This advance reflects the idea that innovation is increasingly the result of multi-agent collaborative systems, known as networks – it is no longer solely the work of individual entrepreneurs or corporate innovators. For their part, Djellal and Gallouj (2018) consider that, in the field of “*service innovation studies*”, service innovation in its relationship to innovation networks and innovation systems is one of the 15 major challenges for the future. This means that, while networks are already at the heart of “innovation studies” focused on manufacturing industry, their concrete implementation - and, above all, their theoretical application - to services (what we call the tertiaryization or servitization of networks) is still in its infancy and deserves greater attention (Mustak, 2014; Desmarchelier *et al.*, 2020a). Another invitation to focus on service innovation networks comes from a completely different theoretical corpus, namely that of public administration. Indeed, the “new public governance” paradigm (which competes with the “new public management” paradigm) is based on the rise of production and innovation networks in public services (Kelly *et al.*, 2002; Osborne, 2006, 2010; Desmarchelier *et al.*, 2019, 2020b). The servitization of innovation networks highlighted and called for by “service innovation studies” is thus supplemented here (in the field of public administration) by what could be called a de-marketization of innovation networks (i.e. a shift of focus from market to non-market i.e. public and social).

1.1 A typology of innovation networks

An innovation network is *a form of organization (a structure) that brings together a number of agents interacting in different ways within an innovation project*. Such a definition may, at first glance, seem simple - yet it both hides a number of difficulties and covers a wide variety of configurations. Thus, the number of agents involved may vary (with a strict minimum of three). These agents may be independent individuals, or various organizations represented by individuals. The links between agents are also very heterogeneous (collaboration, cooperation, coordination, partnership, co-creation, etc.), and have been the subject of semantic discussions that are far from being exhausted (Keast *et al.*, 2007; Agger and Hedensted Lund, 2017; Voorberg *et al.*, 2015; Pestoff *et al.*, 2006; Alford, 2014; Bovaird, 2007; Sicilia *et al.*, 2016; Loeffler, 2009). Innovation, which is the target of the network, can vary in terms of both form (product, process, organization, concept, reform, network, etc.) and degree (incremental innovation/radical innovation, exploration/exploitation). It may be designed and produced by the network itself, or, more simply, designed by other agents then adopted and implemented by the network.

Beyond this great diversity, several types of networks can be identified. These illustrate the two trends we mentioned earlier, namely tertiarization/servitization and “de-marketization” of the notion of innovation network (Desmarchelier *et al.*, 2020a). The main criterion of this typology is the *sector* concerned by the innovation in question. This sector defines (or reflects) production activity, which is the network’s main output: goods, market services, public services. *Sector* focus is identified using two axes: manufacturing focus vs. service focus, on the one hand, and market focus vs. non-market focus, on the other (Figure 1). This criterion makes it possible to highlight several types of innovation networks: 1) Traditional Innovation Networks (TINs), characterized by a two-fold focus on the manufacturing and market sector, 2) Market Service Innovation Networks (MSINs), focused on the market services sector, and 3) Public Service Innovation Networks (PSINs), devoted to non-market (public/social) services. To these three independent types, two others should be added: 1) Public Service Innovation Networks for Social Innovation/PSINSIs (a sub-category of PSINs, located like them in the north-eastern quadrant i.e. service focus and non-market/public focus) shown in Figure 1, and 2) Public-Private Innovation Networks in Services (PPINSs), which is an analytical category that brings together MSINs and PSINs (see Gallouj *et al.*, 2013), illustrating a focus on services and on both market and non-market activities.

Figure 1: A typology of innovation networks: tertiarization and de-marketization

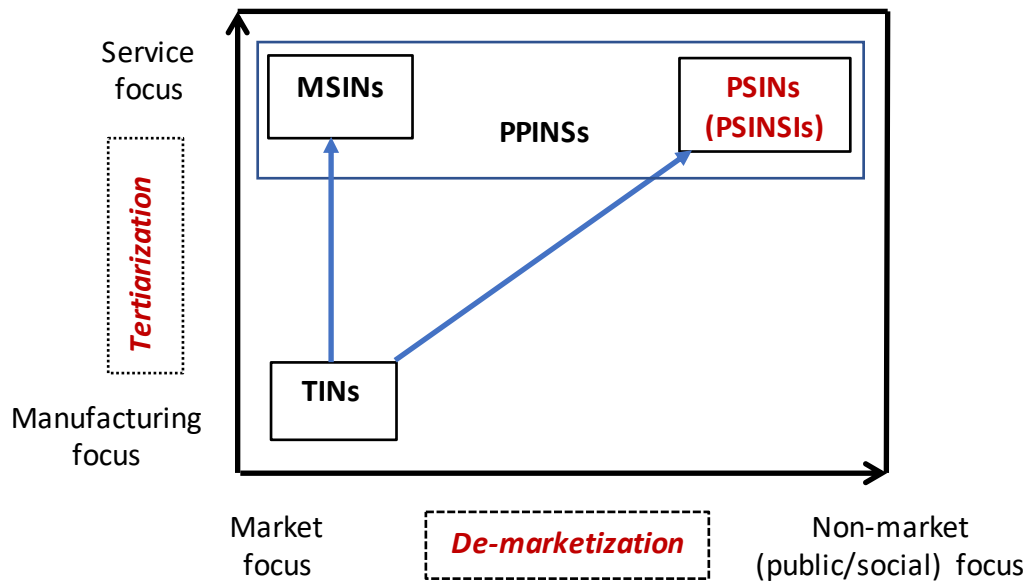
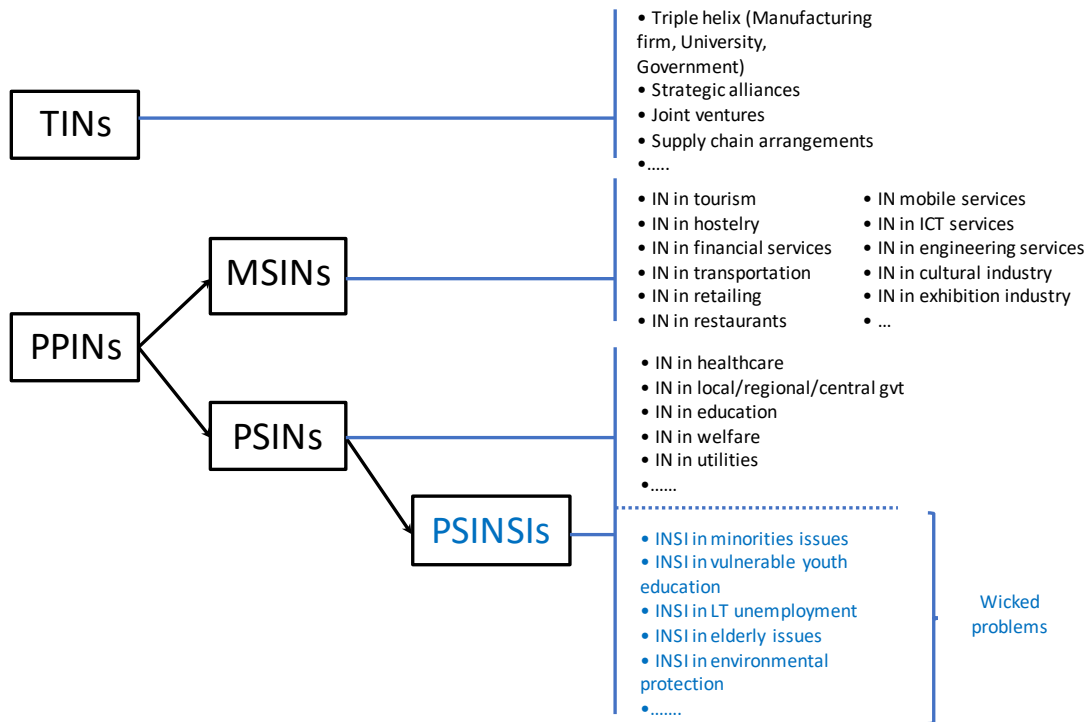


Figure 2 illustrates the relationships between the five types of innovation networks we have identified and provides a number of generic examples, based on a review of the literature (Desmarchelier *et al.*, 2020a, 2020b). Traditional Innovation Networks (TINs) have been by far the most extensively addressed in the literature. These are illustrated by private-private collaborations such as technological alliances, joint ventures between competitors or supply chain arrangements, or by public-private collaborations whose canonical form is the triple helix model involving universities, manufacturing firms and government agencies (Etzkovitz and Leydesdorff, 2000). The literature provides examples of MSINs in tourism, hospitality, financial services, transportation, retailing, and others, as well as examples of PSINs in healthcare, administration, education, etc. (Desmarchelier *et al.*, 2020a, 2020b). As already pointed out, the PSINSIs addressed in this article are a sub-category of PSINs focused on social innovation. These were established to meet, for example, the multiple problems linked to the aging of the population (health, housing, mobility, etc.), the decay of certain residential areas, environmental degradation, caring for refugees and minorities, etc.

Figure 2 : Some generic examples of various types of innovation networks (identified in the literature)



Beyond sectoral focus, the different types of innovation networks we have identified can be more precisely described using the following criteria (see Table 1): types of agents involved in the network; role played by the public agent (when such an agent is indeed involved); nature of the innovation targeted by the network. These criteria are, of course, closely dependent on the sectoral focus considered.

- Regardless of the network type considered (TIN, MSIN, PSIN, PSINSI), the agents involved belong to the following categories: manufacturing firms (MF); market service firms (SF); public service organizations (PSO); third sector organizations (TSO); citizens/users/consumers (C). In theory, all of these actors can be involved in any of the abovementioned types of network. What distinguishes one type of network from another is, as we shall see, the relative importance of some of these agents.

- In these networks, the public agent (in fact the public administration) can, exclusively or jointly, play two different roles: 1) as an operational co-producer of innovation and 2) as supporter/facilitator of innovation or network formation (meta-governance).

- As already stated, these networks may be set up for the production or implementation of innovations having different forms, scales and sources.

Table 1: The various criteria defining the different types of innovation networks

Types of agents involved	Manufacturing firms (MF)
	Market service firms (SF)
	Public service organizations (PSO)
	Third sector organizations (TSO)
	Citizens, users, consumers (C)
Role of public agent	Support, facilitator, meta-governance
	Operational co-producer
Main form of innovation	Technological
	Non-technological
	Technological and non-technological
Main sector concerned by innovation	Manufacturing sector

	Market services sector
	Public services sector

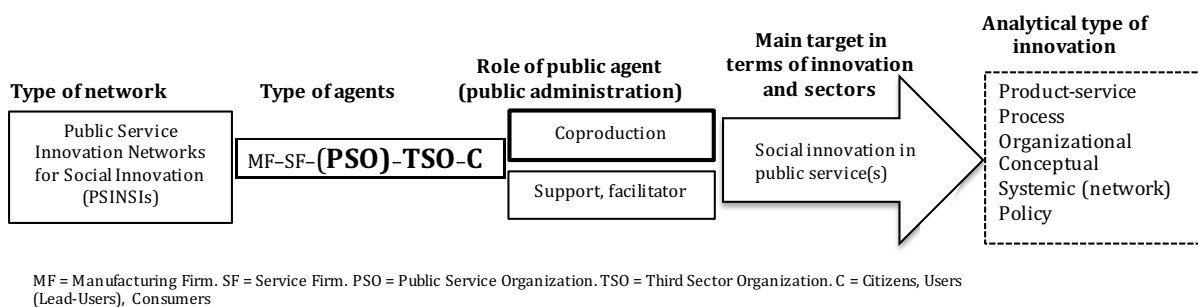
On the basis of these criteria, a simplified general definition of each of the innovation networks under consideration can be formulated. First of all, TINs are networks that focus on manufacturing and technological innovation and in which the public administration is engaged in facilitation and meta-governance activities rather than in co-producing innovation. The archetype for this type of innovation network is the triple helix model. PPINs, which were the object of the European “ServPPIN project” (see Gallouj *et al.*, 2013), are collaborative systems that are open to non-technological innovation and focused on services and public-private collaboration. MSINs are innovation networks focused on market services and service innovation, whatever form it takes (technological or non-technological). PSINs, for their part, focus on innovation in public services. The main actors in such networks are citizens, public sector and third sector organizations. Finally, PSINs, which we discuss further in the following paragraph, are a specific sub-category of PSINs, dedicated to social innovation.

1.2 A focus on PSINs

PSINs, which are the subject of this research, are the ultimate expression of the tertiarization and de-marketization processes of the innovation network concept (see Figure 1). They are set up to address major social or societal issues, such as aging, healthcare, education, transportation and mobility, unemployment, security, children at risk, etc. Their preferred field is the so-called “wicked” problems, i.e. those that are complex, multi-faceted, systemic and often conflictual, which demand multi-agent collaborations because they cannot be solved by just one individual agent. This type of problem often lies at the intersection of the various major societal problems mentioned above. For example, caring for an elderly population raises health, housing and mobility issues as well as work and skill issues (untapped available skills for example), etc. Similarly, caring for children at risk is at the intersection of education, employment, safety, health, etc.

PSINs are networks that are formed, either spontaneously or in a planned manner, within public services defined from both a sectoral and a functional point of view, i.e. services of general interest, whether provided by public or private actors. The paradox here is that PSINs can be established even without the involvement of a public agent (or indeed precisely because of that public agent’s inability - or refusal - to provide a solution to the problem under consideration).

Figure 3: Definition of a PSIN



According to the typology we have proposed in Table 1, any type of agent (MF, SF, PSO, TSO, C) can take part in a PSIN, though the predominant actors are public service organizations (PSO), third sector organizations (TSO) and citizens (C). In Figure 3, these are represented in

bold and enlarged letters. PSO is bracketed in order to underline that the public agent may, in some cases, be absent from the innovation network - which nevertheless remains a public service innovation network insofar as it is dedicated to solving a social problem of general interest. When present in PSINSIs, this public agent is in charge of either co-producing (its dominant role) or supporting/facilitating innovation. The innovation in question is a social innovation.

Both innovation in public services and social innovation, and a fortiori social innovation in public services can encompass *product-service*, *process* and *organizational innovation* categories. However, they also cover other categories highlighted in the literature (Hartley, 2005; Halvorsen, 2005; Bekkers *et al.*, 2006; Windrum, 2008), such as: *conceptual innovation*, *systemic (network) innovation and policy innovation*. *Conceptual innovations* encompass the introduction of new concepts, new general frames of reference, new forms of rationale or even new paradigms. Examples include the concepts of “New Public Management” or “New Public Governance” (Bekkers *et al.*, 2006) or “Big Society” (Lowndes and Pratchett, 2012). *Systemic (or network) innovation* refers to the establishment of new models of cooperation or interaction between organizations, or the improvement of existing systems of cooperation (Halvorsen, 2005). It should be noted that systemic (network) innovation is, in fact, a specific form of organizational innovation. Thus, organizational innovation (in the strict sense) is understood here as the creation of new organizational forms or the improvement of existing organizational forms, with the exception of network forms. *Policy (or regulatory or institutional) innovation* consists of the introduction of new laws and new modes of governance, i.e. new democratic institutions and forms of participation (Bekkers *et al.*, 2006; Hartley, 2005).

2. Research methodology

The EU-funded Co-VAL project made it possible to build a database of 24 case studies¹ of social innovations developed within networked collaborations in the field of public services (Fuglsang *et al.*, 2019; Merlin-Brogniart, 2019; Révész and Rosta, 2019; Magnussen and Rønning, 2019; Peralta, 2019). These case studies from five countries (Denmark, France, Norway, Hungary and Spain) cover the following five areas in which “wicked problems” are likely to give rise to social innovations: 1) elderly issues, 2) education (e.g. school drop-outs), 3) minorities, 4) long-term unemployment, 5) environmental protection (including urban issues and transportation).

In each country, case studies were selected according to three criteria: 1) identification of a “wicked problem” within the five selected areas, 2) identification of a social innovation to address this problem, and 3) development of this social innovation by multi-agent collaboration. The initial idea was to identify and address, one case in each country, in each of the selected areas. However, in the survey’s practical implementation, some cases seemed to overlap several societal domains (see Column 2, Table 2).

Various sources were used for gathering information on the identified cases, including: existing gray literature; stakeholder websites when they exist (which is often the case); YouTube videos and TEDx conferences; focus group discussions; visits to facilities - and above all, interviews with a variable number of stakeholders in each PSINSI. Across all the countries and cases

¹ The COVAL database actually contains 25 cases. We have abandoned one of them ES5 (Madrid Central: Without green, life flourishes project/MCW), which is more of a living lab type experience, a workshop of limited duration (a fortnight), and involving a small number (a dozen) of individual participants

concerned, the partners involved conducted more than 100 interviews (Fuglsang *et al.*, 2019; Merlin-Brogniart, 2019; Révész and Rosta, 2019; Magnussen and Rønning, 2019; Peralta, 2019).

In each of the countries concerned, the case studies consisted of collecting data on five key dimensions relating to types of social innovation, types of innovation network, drivers/barriers, institutional factors and impacts, and performance assessment. We report here on a number of cross-cutting findings relating to some of these key dimensions (and the first two in particular), using the analytical framework outlined in the previous section.

Table 2: Social innovations and PSINSIs in the Co-VAL database

PSINSI case	Social issue	Description of social innovation
Denmark		
DK1: Cycling Without Age (CWA)	Elderly issues	Rickshaw rides for elderly people living in nursing homes or receiving home care, aimed at bringing them out of isolation.
DK2 : Grennessminde	Education, residential accommodation and disability	New educational, vocational training and residential services for mentally disabled young people + platform for social enterprises providing new services.
DK3: Mind Your Own Business (MYOB)	Education, unemployment, minorities	Support for entrepreneurship projects for young people in deprived neighborhoods. Development of their professional and social skills.
DK4: Bybi (Citybee)	Social inclusion, environmental issues	Rental of beehives to create social connections and preserve the environment, training in beekeeping.
DK5: E-Bro and JOBiNTRA	Long-term unemployment	Reorganization by a municipality (a job center) of how to find flexi-jobs for the long-term unemployed, using an IT platform (JOBiNTRA) and changing the organization of work.
France		
FR1: MAIA method	Elderly issues	A method designed to improve care for seniors, based on the <i>integration</i> of support and care services, strategic and tactical coordination, and management of complex cases (by a case manager).
FR2: Zero Long-Term Unemployed Territory (TZCLD)	Long-term unemployment	A project aimed at reducing long-term unemployment by involving the unemployed in the creation of their own jobs, within the framework of Employment-Based Enterprises ["Entreprises à but d'Emplois" (EBE)], which can be nodes of other networks.
FR3: The Booster Program	Education (school dropout)	The Booster program aims to bring minors in difficulty back to school by alternating <i>community</i> civic service with high school refresher courses.
FR4: The Melting Potes Program	Minorities	Integration of groups targeted by discrimination (Roma, then refugees) by means of <i>community</i> civic service (mixing Roma and French people).
FR5: La Fabrique Sailyssienne (The Sailyssian Factory)	Environmental issues (mainly)	New form of cooperation between citizens and the Sailyly municipality, to develop projects of community interest at the municipal level.
Hungary		
HU1: Járókelő (passer-by) Association	Urban issues	A computer platform that allows citizens to report road problems and track their resolution.
HU2: Esélykör (Circle of Opportunity)	Disability care Long-term unemployment	<i>Integrated</i> care (regarding employment in particular) of the disabled by NGOs, in the city of Székesfehérvár.
HU3: CédrusNet (CedarNet)	Elderly care Adult education	Programs and projects for and with the elderly in Kecskemét city.
HU4: No Bad Kid – Pressley Ridge Hungary Foundation	Roma minorities Education	A new educational service designed to meet the integration needs of Roma children
HU5 : BAGás Public Benefit Association	Roma minorities Education Long-term unemployment	A set of services (mentoring, education, legal advice, retailing activities, etc.) intended to help integrate the Roma community.
Norway		
NO1: Flexible relief for dependents	Elderly people living with dementia, and their families	Respite system for family caregivers of elderly people living with dementia, relying on volunteers and supported by a computer platform, to ensure coordination.
NO2: Strength of connecting vulnerable groups	Long-term unemployment Minorities, drug addicts	Connecting two existing networks: one for long-term unemployed drug-addicted men, the other for long-term unemployed immigrant women.

NO3: Refugees as resources in rural areas	Minorities	Method of integrating refugees in rural municipalities, as a way of combating rural desertification.
NO4: Drive For Life (DFL)	Vulnerable youth	Social integration of vulnerable young people by offering closed-circuit driving lessons and basic training in car repair.
NO5: Re-establishing personal networks for people living with dementia	Mental disability	Care for people living with dementia, and respite for care givers, via the creation or re-creation of networks around those living with dementia.
Spain		
ES1: Library of San Fermin project	Excluded citizens (minorities): revitalization of deprived neighborhood	Design of a new type of library and its uses, with multiple stakeholder participation in setting up 1) the library model (types of services desired), 2) the library building (spaces), and 3) the surrounding public spaces.
ES2: Antropoloops project	Education of minority children	An arts education program for “minority children” that remixes fragments of traditional music from around the world to create musical collages. It uses new technologies to promote intercultural dialog, knowledge of traditional music and collective creation.
ES3: Alas Foundation project (elderly with intellectual disability)	Disabled elderly	Facilities for assisting mentally disabled persons in old age.
ES4: The Plan for Professional Education and Employment of La Rioja	Youth professional education and unemployment	Plan to facilitate access to employment for citizens of the La Rioja region.

Source: After Fuglsang *et al.* 2019 ; Merlin-Brogniart, 2019 ; Révész et Rosta, 2019 ; Magnussen and Rønning, 2019 ; Peralta, 2019

Table 2 describes the social innovations and PSINSIs cases in the Co-VAL database. Some of these PSINSIs bear the name of the association or institution that initiated them; in all cases, they are multi-agent networks involving public and private actors. These cases are envisaged according to country, social problem(s) addressed, and a summary description of the social innovation at work in the network.

3. Social innovation in the PSINSIs of the Co-VAL database

It is not always easy to appraise the nature of a given social innovation, i.e. to translate its general description (Table 2) into analytical categories (types) (Table 3). Indeed, the innovation carried out by the network may be multi-faceted, encompassing several innovations of different natures, and having different links between them: association (architectural innovation), determination (one innovation gives rise to another - for example, a new service requires a new process/organization). The line drawn between some traditional types of innovation (process innovation/organizational innovation) can be unclear, especially in service activities, whether market or non-market. The nature of the innovation and its typification also depend on the actor concerned. Thus, what is a technological product innovation for a supplier of technical systems may become a technological process innovation for its customer.

Nevertheless, we carried out this typification exercise using the categories set out above (§ 1.2): *product-service innovation*, *process innovation*, *organizational innovation*, *conceptual innovation*, *systemic (network) innovation*, *policy innovation*, etc. (see Table 3).

Table 3: An attempt to typify social innovations in the Co-VAL database

PSINSI case	Innovation type
Denmark	
DK1: Cycling Without Age (CWA)	- Product/service innovation (rickshaw ride) - Conceptual innovation (CWA is a simple idea that has become a worldwide movement) - Process innovation (use of the rickshaw as a means of mobility, which is original for elderly people)

	- Systemic (network) innovation [Type 1] (new forms of collaboration)
DK2: Grennessminde	- Product/service innovation (training services + various new services offered by the social enterprises involved) - Process/organizational innovation (formalization of teaching methods) - Systemic (network) innovation [Type 1] (new ways of collaborating with partners, especially municipalities)
DK3: Mind Your Own Business (MYOB)	- Organizational innovation (horizontal organization and collective decision-making within the association) - Systemic (network) innovation [Type 1] (strategic collaborations with private partners) - Conceptual innovation (learning a business-oriented logic including in terms of vocabulary used)
DK4: Bybi (Citybee)	- Conceptual innovation (paradigm shift: beyond consumerism, new principles of production, consumption and life) - Product/service innovation (beekeeping and honey production courses) - Organizational innovation (which establishes new and inclusive modes of co-production and interaction) - Systemic (network) innovation [Type 2] (creating social networks around the hive and its exploitation)
DK5: E-Bro and JOBiNTRA	- Technological product innovation (JOBiNTRA from the point of view of E-Bro, the IT company) - (Technological) process innovation (JOBiNTRA from the point of view of other actors) - Product/Service innovation (improvement of the flexi-job search service offered to citizens) - Systemic (network) innovation [Type 1] (simultaneous increase in competition and collaboration between the different actors involved in the search for a flexi-job for a given citizen)
France	
FR1: MAIA method	- Organizational innovation (new work organization method, new functions/jobs: pilot, case manager) - Process innovation (new communication tools: multidimensional analysis form and multidimensional evaluation tool, individualized service plan, shareable information system) - Systemic (network) innovation [Type 1] (networking and integration of actors based on other organizational and process innovations) - Policy innovation (MAIA is now a public policy institutionalized in the Family and Social Action Code)
FR2: Zero Long-Term Unemployed Territory (TZCLD)	- A conceptual innovation (a new business model: reallocating to employment the costs of unemployment) - Organizational innovations: a new recruitment method known as reverse recruitment [jobs created according to the skills of individuals and not traditional selection], creation of an Employment-based Enterprise (EBE), horizontal management within EBE. - Systemic (network) innovations [Type 2]. EBE is often the node of a new network.
FR3: The Booster Program	- Product/service innovation: new flexible training services (adapted to specific cases) and new miscellaneous services carried out as part of the civic service (ad hoc/customized + architectural dimensions) - Organizational/process innovation: mixed teams (systematically associating minors and adults)
FR4: The Melting Potes Program	- Product/service innovation: new flexible training services (adapted to specific cases) and new miscellaneous services carried out as part of the civic service (ad hoc/customized + architectural dimensions) - Organizational/process innovation: mixed teams of around 20 volunteers (systematically involving half Roma and/or refugees and half indigenous people)
FR5: La Fabrique Sallysienne (The Sallysian Factory)	- Systemic (network) innovation [type 1 and type 2]. The network is itself an innovation, which will give rise to network innovations - Product/service innovations (participatory garden, car sharing, magazine exchanges, beehives...)
Hungary	
HU1: Járókelő (passer-by) Association	- Technological process innovation (innovative IT platform) - Systemic (network) innovation [Type 1] (establishes a network between citizens, authorities, repairers, etc.)
HU2: Esélykör (Circle of Opportunity)	- Systemic (network) innovation [Type 1]: it is the building of the network itself that improves services to disabled people
HU3: CédrusNet (CedarNet)	- Product/service innovations: various training modules for the elderly, a “senior knowledge bank” containing the expertise and contact details of retired professionals wishing to help the community - Systemic (network) innovation [Type 2]: creation of “cedar circles”, small self-organized informal networks (such as living labs) that provide solutions to community problems
HU4: No Bad Kid – Pressley Ridge Hungary Foundation	- Product /service innovation (educational services with bricolage ad hoc/customized dimension)
HU5: BAGázs Public Benefit Association	- Product/service innovations (mentoring, education, legal advice, business activities, etc.) - Conceptual innovation (giving a chance, not giving money; not accepting public funding) - Organizational innovation (permanent presence in the camps, mobile charity shop)
Norway	
NO1: Flexible relief for dependents	- Product/service innovations: support/respite services for people living with dementia caregivers, counseling services, training services - Technological process innovation (improvement of an existing IT platform, FRIDA, by adding a module for dependents)
NO2: The strength of connecting vulnerable groups	- Product/service innovation (job search assistance for long-term unemployed drug addicts, job search assistance for long-term unemployed immigrant women) - Organizational innovation (café where members of both networks meet) - Systemic (network) innovation [Type 1]: connecting both networks (both PSINSIs)
NO3: Refugees as resources in rural areas	- Organizational innovation (method for increasing the number of refugees in training or employment after finishing the introductory program)
NO4: Drive For Life (DFL)	- Product/service innovation (driving training, car mechanics training, personal development) - Process innovation (a car driven in closed circuit)
NO5: Re-establishing personal networks for people living with dementia	- Product/service innovation (dementia care service, respite service) - Systemic (network) innovation [Type 2] (creating or recreating networks around older people living with dementia)
Spain	

ES1: Library of San Fermin project	<ul style="list-style-type: none"> - Conceptual innovation (a new type/concept of library) - Product/service innovation: new services that go beyond those of a traditional library. - Systemic (network) innovation [type 1]: co-creation system with stakeholders. An essential aspect of this innovation is the network itself
ES2: Antropoloops project	<ul style="list-style-type: none"> - Product/service innovation (artistic training/education service) - Process innovation. Use of digital technologies in music learning
ES3: Alas Foundation project (elderly with intellectual disability)	<ul style="list-style-type: none"> - Product/service innovation: facilities and services to address aging issue of mentally disabled people - Systemic (network) innovation [Type 1]: Innovation in the way of dealing with other stakeholders - Systemic (network) innovation [Type 2]: The Alas foundation is the central node of several networks proposing different social innovations (ES3 is one of them)
ES4: The Plan for Professional Education and Employment of La Rioja	<ul style="list-style-type: none"> - Policy innovation: this is a public policy innovation aimed at improving the employability skills of young people and the long-term unemployed in the La Rioja region - Systemic (network) innovation [Type 1]: innovation also lies in the way the different stakeholders work together

The vast majority of the social innovations identified in the Co-VAL database are (or are also) **product-service innovations** (16 cases). They consist of the provision of new services to users, in response to a “wicked problem”. At the time it is investigated, the network may be focused on a single product-service innovation (for example, in DK1 (Cycling Without Age) case, a rickshaw ride) or on several that make up a package (architectural or combinatorial innovation). HU3 (CédrusNet/CedarNet) and HU5 (BAGáz's Public Benefit Association), for example, illustrate the latter case. Indeed, HU3 combines different training modules for older people with “a senior knowledge bank” containing the expertise and contact details of retired professionals willing to help the community. Similarly, HU5 provides many new services: mentoring, education, legal advice, retail activities, etc.

As is often the case in services, **product-service innovations are often accompanied by (or based on) innovative process and organizational changes (process and organizational innovations)**. For example, DK1 (Cycling Without Age-CWA) is based on the original use of rickshaws to walk the elderly and bring them out of their isolation, ES2 (the Antropoloops project) is an integration program through musical education, aimed at minority children, and is inconceivable without the digital technologies that allow musical collages, NO4 (Drive For Life-DFL) is based on closed-circuit vehicle driving, NO1 (Flexible relief for dependents), on the addition to the existing IT platform (FRIDA) of a module for care recipients.

Social innovation can however take the form of **a process, organizational or systemic innovation for a given service that is unchanged** (or little changed) in its formal specifications. In such a case, the innovation lies not in the service itself, but in how it is designed, produced or delivered. Thus, in the DK5 case (E-Bro and JOBiNTRA), the two central elements are JOBiNTRA, the technological process innovation and the new network organization established between the municipal job center, employment agencies and citizens (systemic innovation). These elements make it possible to provide a flexi-job search service to citizens. Such a service is not new in itself, even though the innovations in question increase people's chances of finding flexi-jobs. In HU1 (Járókelő/passers-by), social innovation primarily takes the form of process innovation (an IT platform) to provide a service that already existed in other forms (letter to the mayor to report road problems).

Some of the technical systems used are technological process innovations in the truest sense. This applies, for example, to DK5 (E-Bro and JOBiNTRA) in which JOBiNTRA is an innovative IT platform designed by the IT company E-Bro, to HU1 (Járókelő/passers-by), which is also a new IT platform or to FRIDA in the case of NO1 (Flexible relief for dependents). In other cases, where the technology is not new, what leads us to qualify it as a process innovation is its use in a new and original context. Examples include the use of rickshaws to take senior

citizens outside (DK1), and the use of vehicles in closed circuits as a way of caring for vulnerable young people (NO4), etc.

The notion of **systemic or network innovation** merits special attention. Indeed, all the social innovations in our database have an obvious and tautological relationship with networks, since they are, by definition, designed, produced, and implemented within networks. From this point of view, all are therefore systemic or network innovations. Nevertheless, we will limit the use of the notion of systemic or network innovation here to just two configurations:

1) *Type 1 systemic or network innovation*: when the innovation lies, mainly or significantly, in the mode of collaboration, that is, in the constitution of the network, in other words when the innovation is the network itself.

2) *Type 2 systemic or network innovation*: when the innovation produced by the network consists itself of new networks, in other words when the network produces new networks.

Examples of *Type 1 systemic innovations* include the following: DK3 (Mind Your Own Business), which involves strategic collaborations with private partners; FR1 (the MAIA method), which consists of networking and integrating actors while building on other organizational and process innovations; NO2 (The strength of connecting vulnerable people), whose innovation consists of connecting two existing networks; HU1 (Járókelő/passer-by), which establishes a network between citizens, authorities, repairers, etc.

Type 2 systemic innovations include: DK4 (Biby/Citybee), which consists of creating social networks around beehives and their exploitation; NO5 (Re-establishing personal networks for people living with dementia), which aims to recreate networks around the person living with dementia; HU3 (CédrusNet/CedarNet) with its creation of “cedar circles”, which are networks of expertise established for and by senior citizens.

It should be noted that some cases involve both *Type 1 and Type 2 systemic innovations*. For example, in the FR5 case (The Saillyian Factory) the network, which consists of a multi-agent arrangement to design new product-services for the community, is itself an innovation (Type 1 systemic innovation). Yet it is designed to bring about innovations of different types, including new networks (e.g. the participatory garden). From this perspective, it therefore also refers to a Type 2 systemic innovation.

Social innovations, whether primarily product-service, organizational or network innovations, are also (or are also based) in some cases, on **conceptual innovations** that reflect, at various levels, new world views that challenge the assumptions underlying existing services, products, processes and organizational forms (Windrum and Koch, 2008). Conceptual innovations are mentioned in six cases (see Table 3). These include DK1 (Cycling Without Age-CWA) which is a simple idea (offering rickshaw rides to senior citizens to bring them out of their isolation) that has turned into a concept, becoming a worldwide movement in just a few years, FR2 (Zero Long-Term Unemployed Territory-TZCLD), that expresses a new business model that entails reallocating the costs of unemployment to employment.

Finally, two of the cases considered entail an explicit **policy innovation** dimension. One is FR1 (MAIA method). In France, the MAIA method is now a public policy, institutionalized in the Family and Social Action Code. The other is ES4 (The Plan for Professional Education and Employment of La Rioja), which is a public policy innovation aimed at improving the employability skills of young people, and long-term unemployed people, in the Spanish region of La Rioja.

4. Formation and functioning modes of PSINSIs

Although they differ from Traditional Innovation Networks (TINs) and Market Service Innovation Networks (MSINs) (see Section 1), PSINs devoted to social innovation (PSINSIs) are not a homogeneous category, either in terms of their structure (limited here to the nature and number of stakeholders), or in terms of their mode of formation, mode of functioning, or the evolution of these elements.

4.1 The structure of PSINSIs

Whether addressed through the *number* or *nature* of stakeholders, the structure of PSINSIs is of course evolving over time. We report here on these variables at the time *t* of the empirical investigations (late 2018-early 2019).

The nature of the actors

The nature of the actors involved in the network is described, in a theoretical way, in Section 1.1 (see Table 1). Although the literature highlights public-public and private-private PSINSIs (Desmarchelier *et al.*, 2020a, 2020b), at the moment of our investigation, the PSINSIs in our database are, without exception, public-private networks, which therefore associate public agents (various types of public service organizations) and private agents (citizens or third sector organizations and also manufacturing or service firms) (Table 4).

Table 4: Nature of actors and size of PSINSIs at the time of the investigation

PSINSI case	Size on t (-2018-2019)*	Participants nature [MF, SF, PSO, TSO, C1, C2] at the time of empirical investigation (late 2018-early 2019 unless otherwise specified). Non-exhaustive list
DK1: Cycling Without Age (CWA)	L	Copenhagen municipality [PSO], many municipalities in Denmark and other countries [PSO], Cykling Uden Alter-CUA and Cycling Without Age-CWA [TSO], many care centers [PSO], rickshaw manufacturers [MF], volunteers [C], many manufacturing and service firms such as AirBnB, Goodwings, GSK, Zindesk... [MF and SF], elderly [C1]....
DK2: Grennessminde	L	Grennessminde Foundation [TSO], central government through STU (special planned youth education program) [PSO], other STU providers [TSO], municipalities/job centers [PSO], 8 social enterprises [TSO], around 150 private sector firms providing work placements [MF and SF], disabled children [C1], their family [C1]...
DK3: Mind Your Own Business (MYOB)	L	Association MYOB [TSO], Danish Refugee Council [TSO], volunteers (the venture pilots) [C], mentor companies [MF, SF], municipalities [PSO], non-profit housing associations [TSO], TrygFonden [TSO], Tuborgfundet [TSO], Bikubenfonden [TSO], young male refugees [C1]...
DK4: Bybi (Citybee)	M	Association Bybi [TSO], social organizations [TSO], public organizations [PSO], enterprises [MF, SF], schools [PSO], non-profit housing organization (3B) [TSO], Sundhom activity center/municipality [PSO], Grennessminde [TSO], universities [PSO], individual employees, vulnerable persons, schoolchildren [C1]....
DK5: E-Bro and JOBiNTRA	M	Job Center Brøndby/Brøndby municipality [PSO], E-Bro [SF], 6 recruitment agencies [SF], private enterprises [MF + SF], jobseekers [C1]...
France		
FR1: MAIA method	L	[PSOs]: Regional Health Agency, departmental councils, public hospitals, public nursing homes, municipalities, CLIC (local information and coordination centers), CARSAT (pension insurance institution), CPAM (primary sickness insurance fund); [TSOs]: Alzheimers association, other associations, gerontologic networks; [SF]: insurance companies; private hospitals, private nursing homes, private medical practitioners; [C1]: patients, family, etc.
FR2: Zero Long-Term Unemployed Territory (TZCLD)	L	Pre-experimentation network (1995): ATD Quart Monde [TSO], Seiches-sur-Le-Loir municipality [PSO], AITA (adapted work intermediary association) [TSO], long-term unemployed [C1]. Design national network (2014-2016): ATD Quart Monde [TSO], Le Secours Catholique/Catholic Relief [TSO], Emmaüs France [TSO], Le pacte civique/Civic pact [TSO], AITA (adapted work intermediary association) [TSO], TZCLD

		association [TSO], Fédération des acteurs de la solidarité/Federation of solidarity actors [TSO], 1 parliamentarian (Laurent Grandguillaume) [C2/TSO]. Local experimentation networks (10 territories in 2016): TSO (various associations for combating exclusion), PSO (various local and regional authorities, national employment agency), SF and MF (manufacturing and service firms), C1 (long-term unemployed and their relatives).
FR3: The Booster Program	L	Unis-Cité association [TSO], Civic service agency [PSO], MLDS (Department in charge of school-drop-outs/Ministry of national education) [PSO], Coca Cola [MF], HSBC [SF], Suez [SF], CIO (Centre d'Information et d'Orientation/Information and orientation department/Ministry of national education) [PSO], Missions locales/local missions [TSO], ASE (Aide Sociale à l'Enfance) [PSO], High schools [PSO], Les Restos du cœur [TSO], Banque alimentaire/Food bank [TSO], Secours populaire [TSO], volunteer teachers and trainers (C1), etc.
FR4: The Melting Potes Program	M	Unis-Cité Association (various local branches) [TSO], Civic service agency, les Enfants du Canal Association [TSO], Health-Security Platform/Regional Health Agency of Toulouse municipality [PSO], schools [PSO], associations [TSO], external individual actors [C], DRJSCS (Direction Régionale et Départementale de la Jeunesse, des Sports et de la Cohésion Sociale/Regional and Departmental Directorate for Youth, Sports and Social Cohesion) [PSO], CASNAV (Centre Académique pour la Scolarisation des élèves allophones Nouvellement arrivés et des enfants issus de familles itinérantes et de Voyageurs)/Academic Schooling Center for Newly Arrived Allophone Pupils and Children from Travelling Families and Travelers/Ministry of National Education [PSO], DiAIR (Délégation Interministérielle à l'Accueil et à l'Intégration des Réfugiés/Inter-ministerial Delegation for the Reception and Integration of Refugees) [PSO], ANRU (Agence Nationale pour la Rénovation Urbaine/National Agency for Urban Renewal) [PSO], Grenoble metropolis [PSO], CCAS (Centre Communal d'Action Sociale/Social Action Department) of Grenoble municipality [PSO], Roms Action Association [TSO], Francophone and Roma groups [C1], etc.
FR5: La Fabrique Saillysienne /The Saillysian Factory	S-M	Sailly-Les-Lannoy municipality [PSO], schools of Sailly-Les-Lannoy [PSO], citizens of Sailly-Les-Lannoy [C2], citizens of neighboring cities [C2], various associations [TSO], professionals [SF], network of other national cities [PSO], network of other foreign cities (Kirmetown) [PSO], Les Incroyables Comestibles Association [TSO]...
Hungary		
HU1: Járókelő (passer-by) Association	L	Járókelő association [TSO], For profit companies (e.g. Telecom, JC Decaux) [MF + SF], Public service providers (e.g. public transport, waste management) [PSO], local authorities [PSO], Biking associations [TSO], Sponsors (e.g. SEEDS program of ERSTE foundation, Invitech) [TSO and SF], Citizens [C1], etc.
HU2: Esélykör (Circle of Opportunity)	M	Civil Center Public Benefit Foundation (CiCe) [TSO], some 30 NGOs specializing in the disability issue [TSO], local government (municipality of Székesfehérvár) [PSO], private firms [SF + MF], hundreds of citizens [C1].
HU3: CédusNet (CedarNet)	M	CédusNet association [TSO], Kecskemet municipality [PSO], local businesses [MF + SF], other NGOs [TSO], local residents, elderly people [C1/C2]...
HU4: No Bad Kid – Pressley Ridge Hungary Foundation	M	Pressley Ridge Hungary Foundation [TSO], László Tóth Elementary School, Ilona Zrínyi Elementary School of Kecskemét [PSO], Hajnalcsillag Classroom and Pancsinellő Playhouse [TSO], Reformed Church Community of Kecskemét [TSO], Kecskemét municipality [PSO], HEKS (Relief Organization of Swiss Protestant Churches) [TSO], Kecskemét School District [PSO], Lajos Kossuth elementary school of Győr [PSO], Children [C], parents and family [C1], (retired) teachers through CédusNet (see HU3) [TSO]...
HU5: BAGázs Public Benefit Association	M	BAGázs Association [TSO], schools [PSO], local associations [TSO], Family and child welfare service [PSO], The office of Guardianship Affairs [PSO], the police [PSO], Approximar (Portuguese NGO) [TSO], Prezi [SF], other enterprises [SF + MF], local government of Bag and Dany [PSO], Roms (youngsters and adults) [C1], etc.
Norway		
NO1: Flexible relief for dependents	S	Local development center for nursing home and home care (USHT) [PSO], Directorate of health, municipality [PSO], Co-VAL researchers/INN University [PSO], volunteers [C1], dependent persons [C1], elderly [C1]...
NO2: The strength of connecting vulnerable groups	M	Salvation Army [TSO], Norwegian Labor and Welfare Administration [PSO], municipality (several departments) [PSO], manufacturing and service firms [SF + MF], the Creation café [TSO], long-term unemployed men with drug problems [C1], long-term unemployed immigrant women [C1], etc.
NO3: Refugees as resources in rural areas	M	County governor [PSO], Norwegian Labor and Welfare Administration [PSO], INN University [PSO], Educational agency, three municipalities [PSO], employers [SF + MF], voluntary actors at the municipal level [C1]...
NO4: Drive For Life (DFL)	M	DFL national organization [TSO], DFL local clubs [TSO], municipalities [PSO], nationwide public organization called "Trygk trafikk" (Safe traffic) [PSO], a bank foundation [TSO], youths [C1], etc.
NO5: Re-establishing personal networks for people living with dementia	MS	Municipality [PSO], Health directorate [PSO], people living with dementia [C1], usual family caregiver [C1], personal networks around people living with dementia [C1]....
Spain		
ES1: Library of San Fermin project	M	Various departments of Madrid municipality (General Directorate of Intervention in the Urban Landscape, General Directorate of Libraries, Archives and Museums, Municipal Housing and Land Company, Municipal Board of Usera) [PSO], Collective Basurama (social architects) [SF], Neighborhood Association of San Fermin [TSO], Project San Fermin Association [TSO], San Fermin Cultural Center [TSO], Republic of Brazil Primary School [PSO], Republic of Brazil Mothers and Fathers Association [TSO], Gea 21 (design firm) [SF], individual citizens [C1], etc.

ES2: Antropoloops project	S	Antropoloops group [TSO], Carasso Foundation [TSO], San Jose Obero primary school in Seville [PSO], Instituto de la cultura y las artes of the Seville municipality [TSO], Zemos 98 [TSO], students [C1], families [C1], etc.
ES3: Alas Foundation project (elderly with intellectual disability)	M	Alas Foundation [TSO], Plena Inclusión Association [TSO], other associations [TSO], public administrations [PSO], mentally disabled people in old age [C1], family [C1]...
ES4: The Plan for Professional Education and Employment of La Rioja	M	CEFE (Regional department for education, training and employment) [PSO], UGCT et UCOO (2 workers unions) [TSO], FER (the regional association of enterprises) [TSO], ASPRODEMA (association of disabled people) [TSO], CERMI (Consejo Estatal de representates de Minus validos) [PSO], the political parties [TSO], etc.

* Size (not including type C1 users/citizens): Small (S) : fewer than 10. Medium (M) : from 10 to 100. Large (L) : more than 100. The reference year t covers the period end of 2018-2019.
 ** MF = Manufacturing Firms, SF = Service firms, PSO = Public Service Organizations, TSO = Third sector Organizations, C1= Type 1 citizens, not involved in social innovation, C2 = Type 2 citizens involved in social innovation

Source: After Fuglsang *et al.* 2019; Merlin-Brogniart, 2019; Révész et Rosta, 2019; Magnussen and Rønning, 2019; Peralta, 2019

The analysis of the nature of the actors of the PSINSIs in the Co-VAL database raises a certain number of remarks. *First of all*, insofar as it is accepted that a PSINSI always includes at least those citizens who are recipients of the service (and therefore private agents), it would be valid to ask whether public-public PSINSIs are only theoretical constructions that do not exist in reality. *Secondly*, all PSINSIs are systems of interaction between individuals. However, in most cases, individuals represent an organization, and networks are essentially inter-organizational collaborative systems. *Moreover*, the question of the nature of the actors gets different answers depending on when the network topography is considered - at which stage of its life cycle. After all, the network may, for example, be private-private at its beginning, and turn public-private later on, or vice versa. In Table 4, unless otherwise indicated, the composition of the PSINSIs is considered at the time of empirical investigation (late 2018-early 2019). *Lastly*, some actors in the PSINSIs considered are nodes of other PSINSIs. For example, retired professors from HU3 (CédruNet/CedarNet) are involved in HU4 (No Bad Kid - Pressley Ridge Hungary Foundation). Similarly, Grennesminde is involved in several PSINSIs: DK2 and DK4, and both the Unis-Cité Association and the Civic Service Agency play a central role in FR3 and FR4.

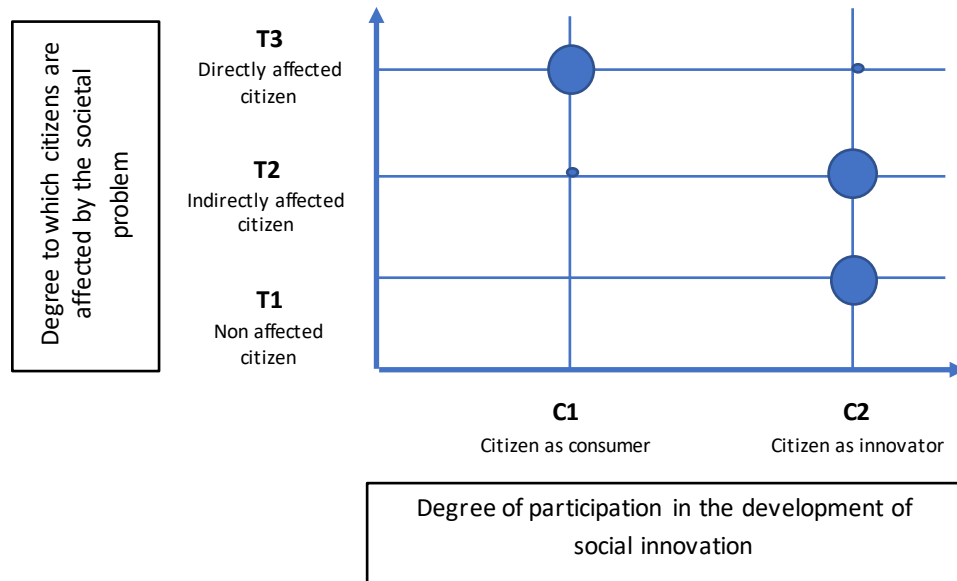
It should also be emphasized that in terms of their participation in PSINSIs, two types of citizens have to be taken into account (see Figure 4): citizens as recipients (consumers, users) of social innovation (C1), and citizens as initiators of the network or active stakeholders in the constitution of the network and the design of social innovation (C2). Although not always an easy distinction to make in practice, it is an important one - especially when it comes to setting the network boundary and assessing its size (number of actors, see next paragraph). Indeed, category C1 is a set of indefinite size and varies according to the nature of the problem handled by the PSINSI (e.g. all children in difficulty within a municipality, all seniors within a region, citizens capable of using a dedicated computer platform to report road problems, etc.).

The above distinction must be seen alongside a further distinction (see Figure 4): there are also different types of citizens, depending on how they are affected by the problem being targeted by social innovation. The first type (T1) is not actually affected (directly or indirectly) by the societal problem under consideration. This is any person who feels concerned, out of empathy or for philosophical or ideological reasons. The second type (T2) is concerned in an effective, though indirect way (the relatives responsible for care of the vulnerable person). The third type (T3) is directly affected by the problem (the vulnerable person themselves).

T3 citizens rarely take part in the C2 form (i.e. as co-innovative citizens) in wicked problems and the PSINSIs they generate. Their fragility, vulnerability and lack of resources reduce their ability to play an active role in social innovation. Generally, these people are passive consumers (C1). On the other hand, T1 and T2 citizens include some of the most active participants in

PSINSIs (intervention in the C2 form) - volunteers and network initiators, for example. There are of course exceptions to this general observation. In some cases, T2 citizens (relatives of a T3 citizen affected by a given societal problem) may themselves be particularly fragile and vulnerable. In this case they may then be consumers of social innovation (participation in the C1 form), rather than contributors to innovation (participation in the C2 form). This situation can be illustrated by NO1, in which the “dependents” (T2) caring for elderly people living with dementia (T3) are themselves vulnerable and in distress. Unable to actively collaborate in a social innovation themselves, (C2) they need help and support, which is provided to them through a social innovation of which they are the beneficiaries (C1).

Figure 4: Different types of citizens according to their degree of sensitivity to societal problems and their contribution to innovation



PSINSI size

Evaluation of PSINSI size encounters the problem of defining the network boundary. One of the difficulties is taking account of citizens [C]. Taking account of citizens involved in the network initiation or implementation [C2] may go without saying, but taking account of citizens who are recipients of the service provided [C1], or those who are co-producers of the services provided (such as volunteers), can raise both theoretical and quantification problems. This quantification difficulty may also arise for certain volunteer firms (for example, those providing jobs to people in difficulty), insofar as their number is indeterminate and they may be regularly called upon by the promoters of the PSINSI.

Disregarding C1 citizens and volunteers (whether individuals or companies), we propose defining network size as follows: a PSINSI with fewer than 10 agents is small (S); a PSINSI with 10 to 100 agents is medium (M), and a PSINSI with more than 100 agents is large (L). Our cases database thus comprises 7 large PSINSIs, 14 medium PSINSIs and 3 small PSINSIs (see Table 4). Since size was assessed at the moment of our investigation, it should be borne in mind that this size assessment relates to networks that are at different stages of development.

Some are in their infancy, having been established in 2017 or 2018. These include FR4 (the melting “potes” program), FR5 (the Sallysian Factory), NO2 (The strength of connecting vulnerable people) and ES2 (Antropoloops project). Others have entered the growth or maturity phase and are spread across the levels of the spatial scale (including global). These include DK1 (Cycling Without Age) created in 2012, DK2 (Grennessminde) founded in 1977, FR2 (Zero Long-Term Unemployed) pre-tested in 1995 and operationalized in 2011 and ES3 (Alas Foundation project) created in 2008 (see Table 5).

4.2 PSINSIs formation

PSINSI formation can be considered at two levels: general determinants and modalities. In both cases, the use of typologies makes it possible to order the great variety of existing configurations.

4.2.1 PSINSI (and social innovation) determinants

The main determinants of PSINSIs and social innovation highlighted in the 24 case studies considered are the following ones: social need or social demand, regulatory changes, science and technology, personal history of the initiator and founding myths, geographical proximity.

- *The Need*

In public services, social innovation and corresponding networks emerge because of a social need or demand. This normally falls within the scope of the broadly defined public sphere (that of general interest, wherever it arises), but – for various, often interrelated reasons - is not addressed by the government. There may be a lack of competence and/or resources, or a political will to disengage from this social need (in the general context of a paradigm shift in public management, for example), etc.

The need reflects an aspiration to solve problems (social problems, in this case). Insofar as PSINSIs are concerned, these problems are most often “wicked”, i.e. systemic in their manifestation, and therefore demanding a systemic resolution arrangement (network). Meeting the needs of an aging population thus raises issues in terms of health, housing, mobility, provision of various services (examples: DK1, HU3), while meeting the needs of minorities raises issues in the fields of education, unemployment, security, etc. (examples: FR4, HU4, HU5, NO2).

In the field of consulting, Milan Kubr (1988) distinguishes between “corrective” problems for which innovation is a therapy undertaken to rectify a difficult situation, “progressive” problems whose aim is to improve a given situation that, while not yet bad, is expected to deteriorate in the long term, and “creative” problems whose aim is to provide a totally new and better solution, without there being any real problem to be solved a priori. Such a typology seems applicable, at least partially, to societal needs, social innovation and PSINSIs. In our database, most problems are “corrective” (curative), insofar as networks are established to address tangible problems that have a concrete manifestation (e.g. minority problems for DK3, FR4, HU5, disabled problems for DK2 and NO5, etc.). But there are also “progressive” (preventive) problems (e.g. DK1, DK4 and NO3).

Conversely, there do not seem to be any “creative” problems in the field of PSINSIs. This is because their purpose is not to create a “demand” or a need (as may be the case for economic

and market innovations), but rather to making the identified need disappear. Thus, the absolute indicator of the success of a social innovation is the disappearance of the need that gave rise to it. From this perspective, no innovation in our database is a success.

Some needs are structural. Taking these into account is part of powerful, generic and sustainable social innovation trajectories. This is the case, for example, with needs related to the aging issue, which are megatrends (Gallouj *et al.*, 2015). On these structural needs/markets, PSINSIs are in “competition” with private providers; these last monopolize the lucrative share of the “market”, while PSINSIs address the non-profitable share. Other needs are cyclical (e.g. care for the homeless in periods of extreme cold, the refugee crisis, and care for different types of socially vulnerable people in times of health crisis such as the COVID pandemic). Though significant, the social innovation trajectories thus generated are not intended to last indefinitely. Lastly, other needs are niche and “market”. These fall within the scope of small-scale, localized social innovation trajectories. On the basis of these various needs and different ways of “discovering social opportunities”, Zahra *et al.* (2009), distinguish three categories of social entrepreneurs: the “social bricoleur”, the “social constructionist” and the “social engineer” (see § 3.1).

• *Regulatory changes*

In several of the cases in our database, legal reforms play an important role. However, the relationship between PSINSIs (and corresponding social innovation) and regulatory change can take various forms.

+ In some cases, regulatory change *determines* social innovation and the creation of the PSINSI. This determination relationship can be illustrated by the following cases:

- DK5. The formation of this network was determined by the Danish flexi-jobs law (“Reform of the Disability Pension and Flexi-job Scheme”) introduced in 2012.
- FR2. Zero Long-Term Unemployed Territory was determined by the 2016 law authorizing territorial experimentation to reduce long-term unemployment.
- NO1. The pilot experience was determined by the 2017 amendment of the Health and Care Services Act, which gave municipalities greater responsibility in supporting dependents.

+ Regulatory change may determine the establishment of PSINSIs, although in some cases a reverse relationship is observed; the regulatory change may itself result from the PSINSI and the corresponding social innovation. For example in the FR1 case, the MAIA method has become public policy and has been institutionalized in the Family and Social Action Code. In the FR3 case, Unis-Cité’s experience inspired the Civic Service Act of March 2010.

+ In other cases, PSINSIs are aimed at social innovation that is also a political (or regulatory or institutional) innovation, i.e. an innovation that consists of the introduction of new laws and new modes of governance, i.e. new democratic institutions and forms of participation (Bekkers *et al.*, 2006; Hartley, 2005). This modality is illustrated by the ES5 case in which the innovation is the implementation, through collaboration between public organizations and trade unions, of a regional plan to promote professional education and combat unemployment.

• *Science and technology*

In contrast to economic innovation, which is most often associated with tangible technological artifacts (products or processes), social innovation is often regarded as an intangible, non-

technological object. We have already called this view into question using some of the cases in our database (see Section 2.1). While social innovation in PSINSIs can have a scientific and technical dimension, it can also be brought about by scientific and technical determinants. Thus with regard to relationships between PSINSIs and science and technology, the Co-VAL database makes it possible to highlight the following different, though not necessarily independent, configurations.

1. PSINSIs in which *the technological platform is a key element*. In the HU1 case, for example, from the outset, the IT platform Járókelő.hu managed by the Járókelő association forms the backbone of the network. Similarly, the ES2 case (Antropoloops) is fundamentally based on the use of digital technologies in music learning and social inclusion. Another example is DK5 (E-bro and JOBiNTRA), in which JOBiNTRA, the platform for communication between the various actors involved in the process of allocating flexi-jobs to the long-term unemployed, plays a fundamental role in the functioning of the PSINSI.

2. PSINSIs in which IT systems are *one element of innovation, among others*. Examples include FR1 (MAIA Method), in which the shared information system is one element of a multiform innovation, and NO1 (Flexible Relief for Dependents), where the FRIDA computer system allows carer coordination (though this could otherwise be achieved by telephone).

3. PSINSIs based on a *philosophical, sociological or psychological theory*. Several cases fall into this category. The first is DK1 (Cycling Without Age), which is driven by a particular conception of leadership called “purpose makers” and by the philosophy of the “random act of kindness”, centered on the value of free acts of benevolence and kindness. The second is DK4 (Bybi/Citybee), driven by Donna Haraway’s thought (2016) and her analysis of an era (Chthulucene, that is following Anthropocene) in which humans and non-humans are inextricably linked, and sympoiesis (or making-with) replaces auto-poiesis (or self-making). The third case is HU4 (No Bad Kid - Pressley Ridge Hungary Foundation), based on rehabilitation (Re-ED) methodologies for young people with emotional disorders that was developed by psychologist Nicholas Hobbs.

4. PSINSIs driven by a *research activity*. This configuration differs from the previous one in that here it is researchers implementing the results of their own research via a PSINSI, as opposed to citizen initiators of networks, who mobilize existing theories. Examples include FR1, the MAIA method, developed by two researchers at the Georges Pompidou European Hospital (Paris), and HU3 - the formulation of the CédrusNet/CedarNet concept by the Hungarian sociologist Erika Sárközy at the Erasmus Research Institute (Budapest).

- *Personal history of the PSINSI initiator and founding myths*

A number of PSINSIs seem to owe their existence to a personal history, which can turn into a founding myth (as frequently happens in traditional entrepreneurship). The following cases could fall into this category. The idea of offering rickshaw rides to seniors (DK1-CWA) came spontaneously to the founder in the fall of 2012, because he regularly came across an old person sitting on a bench in front of his care center, while cycling to work. DK3 (Grennessminde) was initiated by Agnete Grenness who wanted to improve the living conditions of her own learning disabled sister. The founder of Drive for Life (NO4-DFL) was European rallycross champion in 2009. Like the young people to whom he is a role model, he has personal experience of problems related to school *refusers*.

- *Geographical proximity*

In all the cases envisaged, PSINSI formation is favored by the geographical proximity of the agents involved. The essential role of geographical proximity is explained by the very nature of social innovation. Indeed, social innovation is a local innovation or “territorial” innovation (Durance, 2011), a proximity innovation, which mobilizes local actors and solves concrete local problems precisely because it is anchored in a given geographical territory and institutional context: municipality, neighborhood, etc.

4.2.2 PSINSIs modes of formation

Network theory distinguishes two modes of network formation: *spontaneous* and *planned*. In the spontaneous mode, networks emerge in a self-organized way as a result of the convergence of the activities of agents faced with a given problem, in a given context (a neighborhood, city, region, etc.). In the planned mode, their establishment is driven by an initiating agent who convinces other agents to join the network (Table 5).

Table 5: Modes of formation of PSINSIs

PSINSI case	Date of initiation/creation	Mode of formation				
		Spontaneous	Planned	Private Initiator		Public Initiator
				i	o	
DK1: Cycling Without Age (CWA)	2012		X	X		
DK2: Grennessminde	1977		X	X		
DK3: Mind Your Own Business (MYOB)	2010		X		X	
DK4: Bybi	2009		X	X		
DK5: E-Bro and JobIntra	2012		X			X
FR1: MAIA method	2008		X			X
FR2: Zero Long-Term Unemployed Territory (TZCLD)	(1995) 2014		X		X	
FR3: The Booster Programme	2012	(X)	X		X	
FR4: The Melting Potes Programme	2018		X		X	
FR5: La Fabrique Saillytienne/The Saillyian Factory	2017	(X)	X			X
HU1: Járókelő Association	2012		X	X		
HU2: Esélykör (Circle of Opportunity)	2016	(X)	X		X	
HU3: CédrusNet (CedarNet)	2016		X	X		
HU4: No Bad Kid – Pressley Ridge Hungary Foundation	2013		X			X
HU5: BAGázs Public Benefit Association	2011		X			X
NO1: Flexible Relief for Dependents	2016		X			X
NO2: The strength of connecting vulnerable groups	2018		X		X	
NO3: Refugees as resources in rural areas	2015?		X			X
NO4: Drive for life (DFL)	2011		X	X		
NO5: Reestablishing personal networks for people with dementia	2013		X			X
ES1: Library of San Fermin project	2015	(X)	X			X
ES2: Antropoloops project	2017		X		X	
ES3: Alas Foundation project (elderly with intellectual disability)	2008	(X)	X		X	
ES4: The Plan for Professional Education and Employment of La Rioja	2016		X			X

i = individual, o = organization, H = horizontal, V = vertical

In our database (see Table 5), in certain cases (e.g. FR3, FR5, HU2, ES1, ES3) and at certain times, there are manifestations of spontaneity and self-organization. In FR5 and HU2, for example, the PSINSI idea emerged in the course of public events (discussion following a film screening in the municipal hall for FR5, and a forum at which the main stakeholders met, in the case of HU2). Despite some spontaneous manifestations, however all the PSINSIs in the database were planned. The narratives of the various cases make it possible to identify the initiating agent as well as the precise context of the PSINSI initiation and the modalities of the constitution of the collaborative system. This “bias” (in favor of planned PSINSIs) in our database can be explained by the fact that the very existence of a specific initiating agent (often producer of a discourse - or even a mythology - about him/herself) makes it possible to identify a planned PSINSI more easily than a spontaneous one. Moreover, within a group of agents, even when an idea spontaneously emerges, the leadership very often established puts forward one or several actors who appear to be the initiators of a more planned system of collaboration.

The initiator of a planned network can be a public or a private agent. As we have already pointed out, in any innovation network it is ultimately a matter of individuals interacting with others. However, it is important to distinguish between the individual as they work on behalf of the organization that employs them (in this case, it is their organization (o), rather than the persons themselves, that is considered the initiator) and the individual who takes part in the network in a personal capacity (i). If the distinction between private and public initiator is considered without taking into account the institutional dimension (individual vs. organization), then it can be observed in the Co-VAL database (see Table 5) that the initiator is a private agent in 14 cases and a public agent in 10 cases. Yet across both private and public spheres, the initiator is an individual in 6 cases and an organization in 18 cases (8 private organizations and 10 public organizations).

It should be noted that, in our database, where the initiating agent of a PSINSI is private, the individual (i) or organizational (o) nature of the initiator does not pose any problem. Indeed, this agent is either an individual or a third sector organization (association, foundation, etc.). It should be noted that (although theoretically possible), the database does not contain any case where the private initiator is a manufacturing or service company. On the other hand, when the initiating agent is public, it is always an organization (o). In some cases, it should however be noted that although initiated within a public organization, social innovation is developed by an individual who seems to express him/herself as an individual citizen, on the fringes of their professional activity. This situation is illustrated by DK5 (E-Bro and JOBiNTRA), where a civil servant takes innovative initiatives that quickly lead him to leave the administration to set up a company, FR1 (MAIA method) where the initiators of both network and method are two researchers from the Georges Pompidou Hospital, and HU4 (No Bad Kid), where the starting point is the personal initiative of a school principal. It is also illustrated by HU5, where the PSINSI is initiated by Emőke Both, a probation officer from the Service of Probation Office in Pest County, who was responsible for young Roma offenders in the village of Bag. In these cases it is particularly difficult to draw the line between a civil servant’s activity as a citizen (private agent) and as a representative of a public organization (public agent). Thus, we attribute all initiatives to the organization that employs him or her, rather than to the individual.

4.3 PSINSIs modes of functioning

The PSINSI can function in either horizontal (bottom-up) or vertical (top-down) mode (Table 6). However, it is not always easy to determine its mode of functioning.

Indeed, the functioning mode is not always homogeneous within the network.

For example, the network may function in different ways with regard to relationships between the main stakeholders and the relationships between those stakeholders and users/recipients. When considering recipients, network functionality will vary according to its nature. For example, the most vulnerable users are most often in a vertical relationship with the main stakeholders. In the case of HU2, for instance, relationships between the main PSINSI partners are horizontal, whereas those with users (weakened by their disability) are vertical. In the case of NO1, if the recipients (the dependents) are not taken into account, the mode of operation between stakeholders is horizontal (it is a research project). Initially, then, the project operated in a top-down mode vis-à-vis the users. As the project evolved, the mode of operation became vertical, integrating the “dependents” to a greater extent, in order to correct certain mistakes made in defining their needs and implementing solutions.

Similarly, especially when the PSINSI is large, its main stakeholders are not necessarily homogeneous and may include more or less involved subgroups working together in different ways. For example, the mode of functioning may be horizontal at the core of the network, but vertical in terms of relationships between the core and the periphery. Thus, in the case of DK2 (Grennessminde), there is a horizontal (bottom-up) mode of functioning between the Grennessminde Foundation and the private partners (manufacturing and services firms) that offer internships or jobs to young people within the context of legislative change (STU/special planned youth education program). It is probably more vertical (top-down) in the subcontracting relationship established between the government (principal) and Grennessminde.

Table 6: Modes of functioning of PSINSIs

PSINSI case	Date of initiation/creation	Initial mode of functioning		Evolution of the mode of functioning t0 --> t			
		H	V	H->H	H->V	V->V	V->H
DK1: Cycling Without Age (CWA)	2012	X			X		
DK2: Grennessminde	1977	X			X		
DK3: Mind Your Own Business (MYOB)	2010	X			X		
DK4: Bybi	2009	X		X			
DK5: E-Bro and JobIntra	2012		X				X
FR1: MAIA method	2008		X				X
FR2: Zero Long-Term Unemployed Territory (TZCLD)	(1995) 2014	X		X			
FR3: The Booster Programme	2012	X		X			
FR4: The Melting Potes Programme	2018	X		X			
FR5: La Fabrique Sallysienne/The Sallysian Factory	2017	X		X			
HU1: Járókelő Association	2012	X		X			
HU2: Esélykör (Circle of Opportunity)	2016	X		X			
HU3: CédrusNet (CedarNet)	2016	X		X			
HU4: No Bad Kid – Pressley Ridge Hungary Foundation	2013	X		X			
HU5: BAGázs Public Benefit Association	2011	X		X			
NO1: Flexible Relief for Dependents	2016	X		X			
NO2: The strength of connecting vulnerable groups	2018	X		X			
NO3: Refugees as resources in rural areas	2015	X		X			

NO4: Drive for life (DFL)	2011		X			X	
NO5: Reestablishing personal networks for people with dementia	2013	X		X			
ES1: Library of San Fermin project	2015	X		X			
ES2: Antropoloops project	2017	X		X			
ES3: Alas Foundation project (elderly with intellectual disability)	2008		X			X	
ES4: The Plan for Professional Education and Employment of La Rioja	2016		X			X	

For the sake of simplicity, in our analysis and assessment of PSINSIs modes of functioning (see Table 6), we will only take into account users/citizens if they are actively involved in the network (Type C2 citizen). Neither will we take into account possible differences in functioning modes within subgroups of the network. In other words if, for example, the mode of functioning within a component of the network is horizontal, yet this component is linked via vertical relationships with other components, we will consider that the network as a whole is vertical.

In our analysis of the mode of functioning of PSINSIs, where sufficient hindsight is available, we tried to identify the mode of functioning in the infancy of the network and its mode of functioning at the time of the empirical investigation (see Table 6).

In the Co-VAL database, 19 cases are initiated in a horizontal mode and 5 in a vertical mode, wherein the initiator is most often the conductor. Of the PSINSIs that were horizontal at the outset, 3 have evolved toward a vertical mode of functioning. One of these is DK1 (Cycling Without Age). This PSINSI, which initially functioned in a bricolage way, coped with its own success (and the usurpation of its logo and name) by setting up two coordination structures (associations) - one for the Danish national network (CUA), the other for the international network (CWA). The others are DK2 (Grennessminde) and DK3 (Mind your Own Business), where the founding associations play a central role and have clear leadership. Of the PSINSIs that were vertical at the outset, 2 have become horizontal. These are DK5 (E-Bro and JOBiNTRA) and FR1 (MAIA method). In total, at the time of our investigation, 18 PSINSIs functioned in a horizontal mode, and 6 in a vertical mode.

Regarding the mode of functioning of the PSINSIs, the following remarks can be made:

1. Verticality or horizontality does not depend on network size. Thus, both large and small networks can be observed to function in vertical or horizontal mode.
2. In some cases, the initiators of the PSINSI have made use of specialized coordinators. For example, in the case of ESP1 (Library of San Fermin), the project initiators (namely GDLAM (General Directorate of Libraries, Archives and Museums) and MH&LC (Municipal Housing and Land Company), which are municipality departments) commissioned Gea21 (design specialists) and Collective Basurama (social architects) to organize the interactions, sessions and events that led to the final outcome. These actors of the network are Knowledge Intensive Business Services (KIBS) in the traditional sense of the term.
3. Some PSINSI actors, whether initiators of the network or not, appear as KISS (Knowledge Intensive Social Service) in Desmarchelier *et al.*'s sense of the term (Desmarchelier *et al.*, 2020c). Like KIBS, they provide their partners with knowledge and assist them in innovation (here, social innovation) and build a bridge between multiple actors. Their disappearance can be particularly detrimental to the network. For example, in the case of DK2, the Grennessminde Foundation has all the characteristics of a KISS. Similarly, in HU2 (Esélykör/Circle of Opportunity), the Civil Center Public Benefit Foundation (CiCe) is described as a thinktank and coordinator for the PSINSI. The decision made by this KISS to leave the network in 2019

raised the usual question of network fragility in the event of the hub actor's defection (Desmarchelier *et al.*, 2020c).

4. The existence of a system integrator (a conductor or hub actor) does not necessarily mean that the network functions vertically. On the contrary, this particular actor may in fact perform a coordinating function that ensures horizontal functioning.

Conclusion

The innovation network concept denotes a multi-agent structural arrangement established to produce innovation in collaboration. Over recent decades, it has been very successful in theoretical, empirical and policy terms (Gallouj *et al.*, 2013). This success can be illustrated by the evolution/renewal of the concept along a dual trajectory of tertiarization and de-marketization. This has led academic research - as well as the operational management of organizations - to attach increasing importance to innovation networks in market services and public services. This article is devoted to the most recent result of this evolution, namely networks dedicated to social innovation in public services, what Desmarchelier *et al.* (2020a) call PSINSIs (Public Service Innovation Networks for Social Innovation).

This paper began by proposing an analytical framework that makes it possible (from both a morphological and a functional point of view) to distinguish PSINSIs from other expressions of the innovation network, namely Traditional Innovation Networks (TINs), Market Service Innovation Networks (MSINs) and Public Service Innovation Networks (PSINs). Second, drawing on rich empirical material collected within the Co-VAL European research project and comprising 24 in-depth case studies of PSINSIs in five European countries (Fuglsang *et al.*, 2019; Merlin-Brogniart, 2019; Révész and Rosta, 2019; Magnussen and Rønning, 2019; Peralta, 2019), we have attempted to get inside the black box of this type of innovation network, seeking to better understand the nature of the social innovation developed and the modes of formation and functioning of these networks.

A number of theoretical, managerial and political issues were not addressed in this work, although they would merit inclusion in a research agenda.

At the managerial level, though we have considered certain aspects of the determinants of social innovation and PSINSIs, we have not addressed the question of the obstacles they face. Our database provides very precise factual elements relating to the various obstacles encountered in the constitution of PSINSIs. One such obstacle is the problem of aligning the institutional logics of the various actors. In the societal fields we have considered (aging, school drop-outs, long-term unemployment, minority issues, environmental and mobility problems), the forces of alignment are powerful, since most PSINSIs have laudable social objectives (caring for the vulnerable, caring for the planet, etc.), which can only lead to buy-in. Moreover, most of the time, PSINSIs are not in competition with other public and/or private actors, since they develop precisely in spaces left unoccupied. However, the forces of misalignment of institutional logics do exist, and the obstacles encountered are numerous (financial, cognitive, technical, human, institutional, etc.); they deserve in-depth analysis.

Another important managerial issue worthy of special attention is the evaluation of the performance of PSINSIs. The traditional indicators used in the technical world (volumes, operations, productivity) are needed, however the tools of the market world (costs, search for financial resources) should not be excluded - even in the field of "wicked" problems. Above

all, however, alternative evaluation tools relating to the civic and social, reputation and creativity worlds, must be considered. The question of institutional alignment/misalignment mentioned earlier is of course expressed here. Indeed, the confrontation of actors' logics is also expressed through the confrontation of their conceptions of performance - which may complement or compete with one another.

At the theoretical and political level, this question of social innovation and the corresponding networks needs to be taken out of its political and theoretical isolation. To us, it seems important to reflect on how - beyond the multitude of more or less formalized and visible experiences and practices - we might envisage recognition of the existence of local and national systems of social innovation, and more broadly the articulation of these systems with traditional local and national innovation systems.

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