Mapping social innovation networks: Knowledge intensive social services as systems builders☆

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ABSTRACT

Social innovations are often seen as the product of social entrepreneurs. This paper instead asserts that social innovations are also routinized. This is the result of the appearance of a new type of actors: Knowledge Intensive Social Services (KISS). Like Knowledge Intensive Business Services (KIBS), KISS are consultancy organizations that provide their clients with specific knowledge to assist them in their innovation efforts. KISS differ from KIBS in that KISS agents are specializing in social innovations. KISS also involve third party agents - public and private - in the service relationship. We show that these connecting activities are creating growing social innovation networks. Despite being very dependent on the initial KISS actor, such networks can become more robust by interacting with other social innovation networks.

1. Introduction

Social innovations are most often the innovations of the not-for-profit sector, sometimes referred to as the social economy. What distinguishes them from standard innovation is their objective, which concerns "*the (re)introduction of social justice into production and allocation systems*" (Moulaert and Ailenei, 2005). They can take a wide variety of forms, ranging from redistribution mechanisms to the provision of health-care, education, and even the provision of stable energy sources (to some remote communities for instance). In addition to the ethical and fairness objectives, social innovations are generally perceived as artisanal. For instance, (Klein et al., 2014, p.11) state that social innovation is "*built locally […] it results from territorialized actions, rather than new mechanisms and processes initiated by large organizations or institutions*".[1] Similarly, Mulgan et al. (2007) underline the initiatives of "*a very small number of heroic, energetic and impatient individuals*" (p. 13) in the emergence of social innovations. While acknowledging the role played by "*social movements*", these authors continue to emphasize the role of "*pioneers*" (p. 15) and "*leadership*" (p. 16) in the making of social innovations.

From a Schumpeterian perspective, these observations suggest that the social economy is characterized by an *entrepreneurial regime* in which radical and infrequent innovations are mostly performed by heroic individuals. Such a regime does accurately describe industries in their infancy, but innovations in maturing sectors generally become more *routinized* - that is, incremental, frequent, and carried out by large established organizations (Baumol, 2002; Winter, 1984).

The history of the social economy is as old as the Industrial Revolution (Mulgan et al., 2007), and is rooted in the charitable practices found in all ancient civilizations. Defourny and Develtere (1999) mention, for instance, farmers' associations during the Tang Dynasty in China; the presence of solidarity practices among working groups in pre-colonial Africa; and the rich community life of medieval Europe. In addition, over time many associations and Foundations have gained considerable importance (e.g. the Red Cross and Red Crescent movements, The Young Foundation, the Wikimedia Foundation, etc.). These observations call into question the perception of social entrepreneurs as the main source of social innovations.

This paper asserts that the social economy actually exhibits characteristics relevant to both the *entrepreneurial* and the *routinized* regimes. In addition, we show that social innovations are becoming routinized thanks to the appearance of a new category of actors: the knowledge intensive social services (KISS). Like knowledge intensive business services (KIBS) - well known in service studies (Gallouj, 2002b; Miles et al., 1995), these provide their clients and partners with specific knowledge and assist them in their (social) innovation efforts.
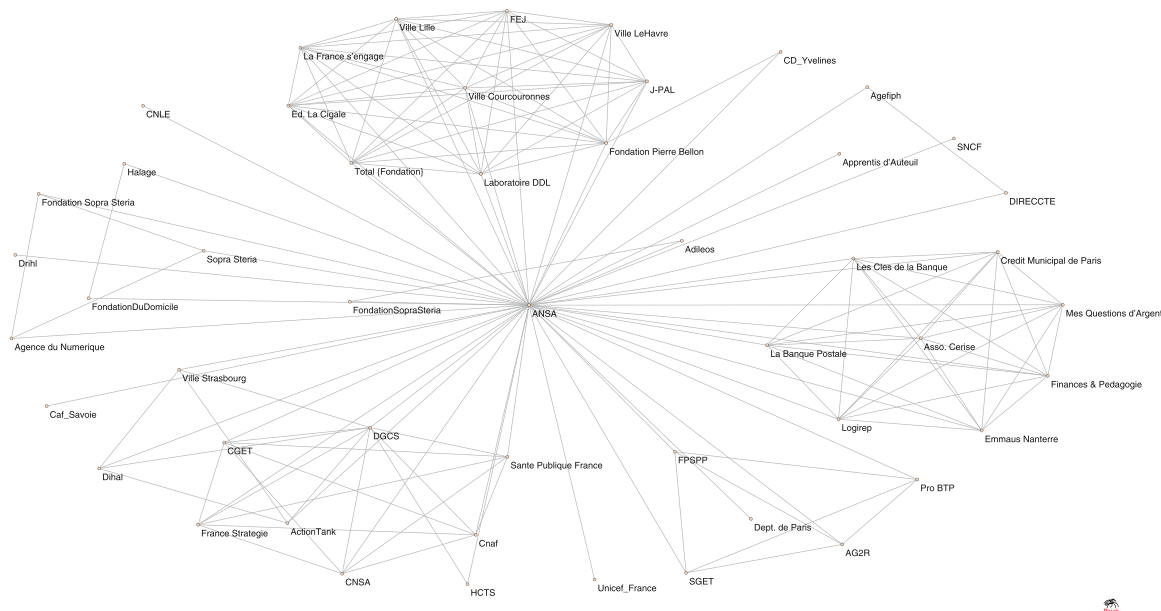
Fig. 1. The network of social innovations built by ANSA in 2019.

Table 1

Descriptive statistics of ANSA's social innovation network. *PL* = Path Length: the average shortest path connecting all pairs of agents within the main component of the network.

Year	Links	Agents	Av. Degree	PL	Nb of Components
2007	6	4	1.50	1.00	1
2008	7	5	1.40	1.30	1
2009	13	8	1.62	1.53	1
2010	17	9	1.89	1.53	1
2011	17	9	1.89	1.53	1
2012	95	25	3.80	1.68	1
2013	96	26	3.69	1.70	1
2014	96	27	3.55	1.73	1
2015	138	43	3.21	1.85	1
2016	189	49	3.86	1.84	1
2017	142	41	3.46	1.83	1
2018	145	42	3.45	1.83	1
2019	157	50	3.14	1.87	1

Furthermore, these actors specialize in connecting social actors, which in turn encourages the emergence of large social innovation networks.

This paper is organized into four sections. In Section 2, we discuss the complementarity between the technological regimes and agents' innovative behaviors. Section 3 is devoted to a discussion of the relevance of these two concepts in the case of the social economy. In Section 4, we provide empirical evidence of the routinization of social innovations through the activities of KISS actors. Section 5 is the conclusion of the paper.

2. Search behaviors and technological regimes

Theoretical discussions on the routinization of innovation processes date back to Schumpeter's writings. The story is well-known; in his *Theory of Economic Development*, Schumpeter (1983) [1934] identifies the individual entrepreneur as the main source of innovation. Thanks to a rare combination of personal qualities, this entrepreneur perceives and seizes profit opportunities through the introduction of new products, new processes, new modes of organization, new sources of inputs, or the uncovering of new markets. Gradually, over the course of economic history, this individual behavior is largely (though never entirely) replaced by the large firm and its R&D department, within which invention and innovation are the product of organizational routines.

Both the infrequent and radical innovations made by heroic individuals, and the routinized search performed by R&D departments, are "search behaviors" (Cyert and March, 1963; Nelson and Winter, 1982). Winter (1984) highlights the fact that these two behaviors thrive in different institutional environments: the "entrepreneurial regime" and the "routinized regime", respectively. These institutional environments are characterized by varying degrees of "*secrecy, patent protection, and intrinsic difficulty of imitation*" (p. 296), as well as by the range of "*technological opportunities*", which is related to the easiness of access to the relevant knowledge base.

The entrepreneurial search is more successful when levels of secrecy and patent protection are low, when relevant knowledge is easily available, and when imitation is relatively straightforward. In such a situation, innovations are primarily introduced by new entrants (Malerba and Orsenigo, 1997). Conversely, large established firms are more likely to be the main innovators when levels of secrecy and patent protection are high, and when imitation is difficult - for instance due to the importance of tacit knowledge in the industry. Such conditions offer significant entry barriers, and thus constitute a favorable environment for the capture of monopoly rents.

Winter (1984) believes the creation of a new industry to be an entrepreneurial activity, he suggests that the entrepreneurial regime precedes the routinized regime in the industry life cycle. This point remains controversial, as Malerba and Orsenigo (1997) provide evidence suggesting that technological regimes can be sector-specific.

In terms of the aforementioned criteria, the advent of tertiary economies has not necessarily modified the institutional environment. It did however disrupt the economic environment in which firms operate: for instance, the saturation of goods markets, or the digitization of the economy require new and more agile market strategies (Arthur, 1996; Kim and Mauborgne, 1999). In this context, innovation calls for the use of a larger knowledge base that exceeds the one that was formerly relevant to specific industries. Largely because of employees' acculturation to the code of their organization, this knowledge is not necessarily available within large organizations (March, 1991). According to Gallouj (1994), Gallouj (2002a) and Gallouj (2002b) the knowledge needs of established organizations have supported the emergence of a third type of search behavior, namely *innovation through interactions* with third party agents - mainly knowledge intensive business services (KIBS). These are consultancies specializing in the
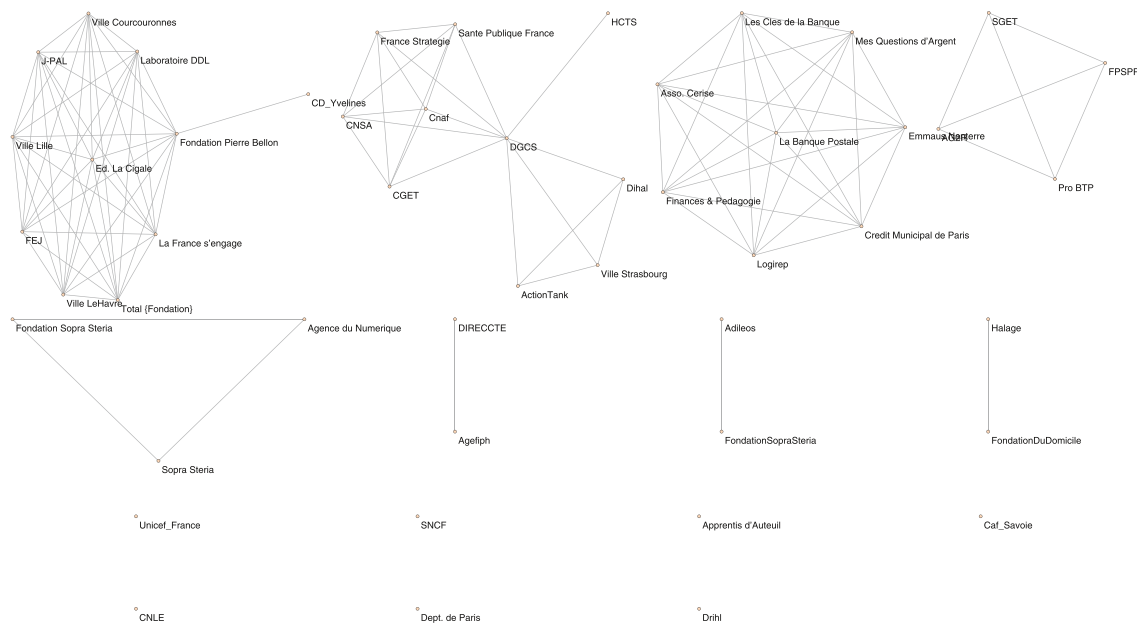
Fig. 2. The network of social innovations built by ANSA in 2019 after ANSA has been removed.

accumulation and processing of knowledge, which they place at the disposal of their clients (Gallouj, 2002b; Miles et al., 1995).

Because KIBS respond to a demand for adaptation expressed by established organizations, this third innovation behavior has surfaced within the routinized regime. This new and emerging mode of innovation proves that technological regimes are not characterized by frozen behavioral patterns: a sector can be routinized even as it experiences the arrival of innovative newcomers - in this case KIBS.

3. Technological regimes and search behaviors in the social economy

The preceding section emphasized the plasticity of the routinized regime: new economic agents (KIBS) accumulate knowledge, making established organizations adaptable to rapidly changing economic and technological landscapes. In comparison, the entrepreneurial regime may seem somewhat ephemeral. Also, Winter (1984) finds that the routinized regime performs better in the long run. Indeed, in his simulation model, frequent incremental innovations favor faster productivity growth than do the infrequent, radical innovations generated by the entrepreneurial regime. However, Baumol (2002) highlights the complementarity of entrepreneurial and routinized innovations for sustained economic growth. In this context, we begin this section by characterizing the technological regime of the social economy. Then, we investigate the search behaviors of economic agents operating within the social economy.

The social economy is characterized by a relative absence of secrecy, as instances of social innovations are highly publicized by political leaders, practitioners and academics (see for example Murray et al., 2010). Moreover, the main driver of social innovators is the quest for social justice, rather than profit. From this perspective, replication is considered as an indicator of success of social innovation. Similarly, patenting is by definition uncommon in the social economy, since patents are designed to provide the successful innovator with extra profit.

These two criteria (lack of secrecy and the irrelevance of patenting) are those of an archetypal entrepreneurial regime. However, replication of social innovations is usually challenging. The literature is full of examples of failed diffusion of innovations. For instance, Akrich et al. (1988) relate setbacks experienced in the diffusion of

photovoltaic kits in Africa. These kits had been conceived by French engineers, and their pre-diffusion had been financed by the French government. They were not adopted by local populations because local electricians found them insufficiently modifiable. Similarly, the "barefoot doctors" of Maoist China[2] could not easily be transposed into western societies. These examples show that, in the case of social innovations, the knowledge base is difficult to grasp - precisely because they often combine codified and technical knowledge with a complex set of social skills. It is not surprising, then, that many social innovations take the form of territory-specific solutions rather than general purpose, easily replicable tool boxes (Dyck and den Broeck, 2013; Moulaert and MacCallum, 2019; Moulaert and Nussbaumer, 2014). This observation is suggestive of significant entry barriers in the social economy, which are typical of routinized regimes.

Altogether, these elements depict a blurred situation, since the social economy exhibits features that are relevant to both regimes. In contrast to this, the literature on social innovation often takes an entrepreneurial view when discussing search behaviors in the social economy (Dacin et al., 2011). For instance, Brown and Wyatt (2010) evoke how Jerry Sternin and his wife - founders of the Positive Deviance Initiative - helped reduce child malnutrition in Vietnam by observing good practice by "positive deviants" - that is, "very poor families whose children were healthy" (p. 32).

While this story may illustrate entrepreneurial search, observation of positive deviants and lesson learning from them is a standardized method that can be replicated to a wide range of social issues. Today, the Positive Deviance Collective takes part in dozens of projects worldwide, and even disseminates toolkits in several languages. As in business sectors, the successful entrepreneurial search became routinized, and this collective now works in the same way as consulting companies: it provides methods and knowledge to actors who are keen on innovating.

Similarly, Mulgan (2006) mentions the role of "heroic, energetic and impatient individuals" (p. 148) in carrying out social innovation. This entrepreneurial view contrasts with his description of the activities of the Young Foundation, which fosters "innovations that take the form of

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[2] Farmers who were "trained to diagnose and treat common diseases without professional assistance" (Rogers, 1983, p. 326) to solve the problems of medical deserts during the Maoist period.
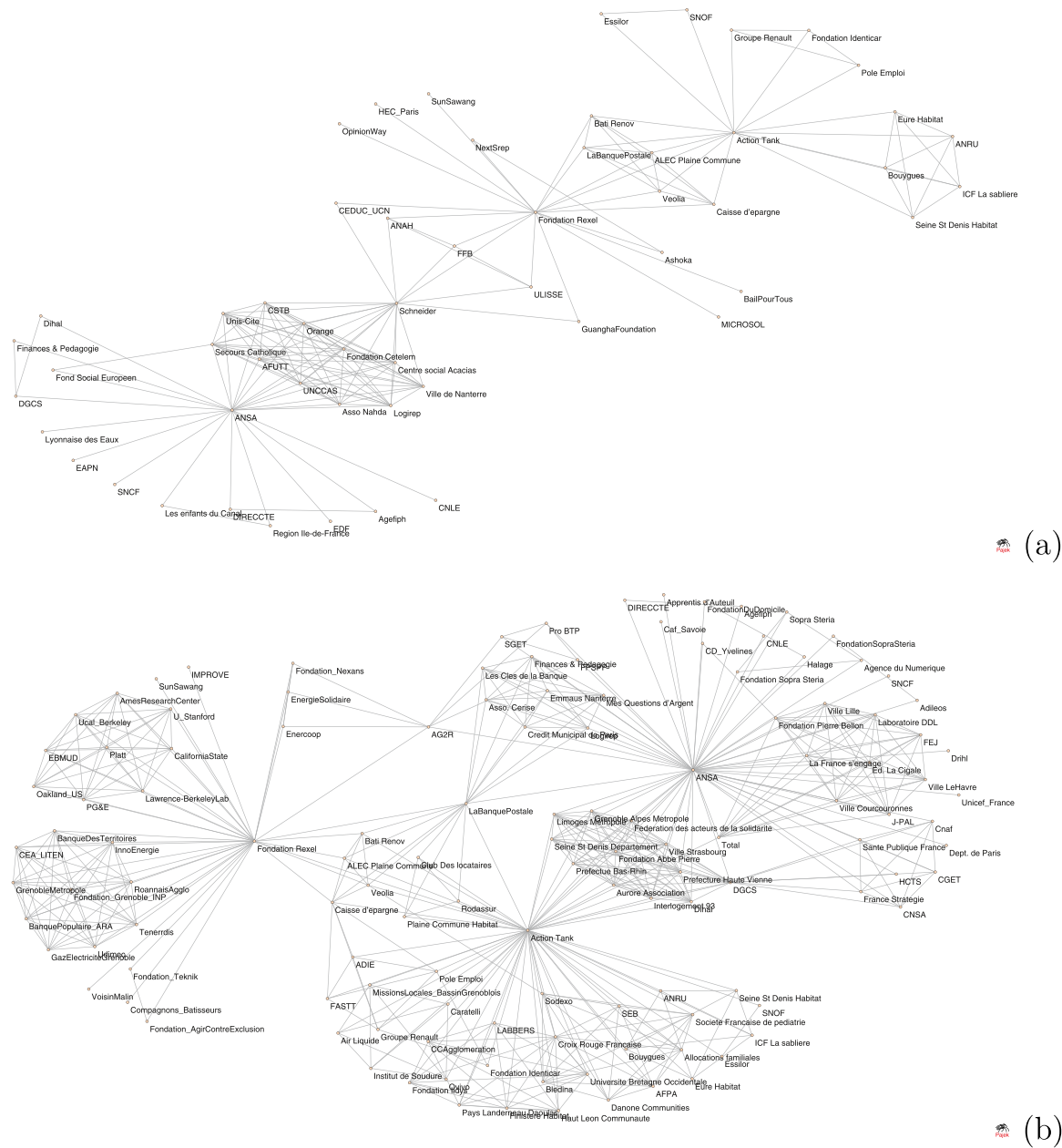
Fig. 3. The ANSA-Rexel-Action Tank network in 2013 (a) and 2019 (b).

Table 2

Descriptive statistics of the ANSA-Rexel-Action Tank social innovation network. PL = Path Length: the average shortest path connecting all pairs of agents within the main component of the network.

Year	Links	Agents	Av. Degree	PL	Nb of Components
2013	163	55	2.96	2.79	1
2014	211	69	3.06	2.65	1
2015	277	95	2.91	2.79	1
2016	413	122	3.38	2.71	1
2017	435	121	3.59	2.60	1
2018	523	134	3.90	2.60	1
2019	508	127	4.00	2.56	1

Fig. 4. Degree distributions in the extended network in 2013 and 2019.

replicable programs or organizations" (p. 148). It does this by promoting "*quick prototyping*" (p. 152) and advocating for "*good names, along with brands, identities and stories*" (p. 153) that will sustain diffusion processes.
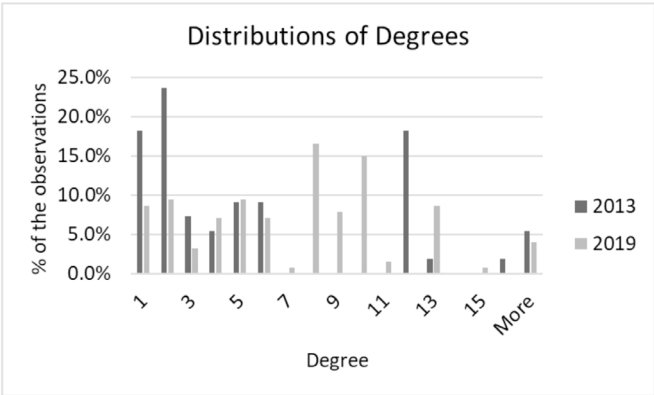
Fig. 5. The extended network without ANSA in 2013 (a) and in 2019 (b).

All these methods are those of the R&D and marketing departments of large organizations. It follows that routinized search should also be acknowledged within the social economy. A social innovator may be a single person or a small collective - but organizations like the Young Foundation and the Positive Deviance Collective provide them with scientific methods. We view these players as driving of routinization of search behaviors in the social economy. Their role is similar to the one played by KIBS in business sectors - but since these are not-for-profit organizations specializing in social innovation, we suggest naming such players Knowledge Intensive Social Services (KISS).

Interestingly, these examples show that routinization of social innovation takes an interactive form. From this perspective, Desmarchelier et al. (2019) point to the existence of (largely under-studied) networks aimed at producing social innovations, which they called "Public Service Innovation Networks for Social Innovation" (PSINSIs). These networks can be formed by different types of actors (market services, manufacturing firms, public administrations, etc.) but the most central actors are part of the social economy. The authors

indicate that such networks can be planned or spontaneous; that is, they can be engineered by a purposeful agent, or emerge via a series of lucky breaks and encounters. The next section will provide evidence that KISS are playing a key engineering role in these social innovation networks.

4. Mapping the role of knowledge intensive social services in social innovation

This section uses three KISS agents as examples: the Agence Nouvelle des Solidarités Actives (New Agency for Active Inclusion, ANSA),[3] Action Tank[4] and the Rexel Foundation.[5] Our objectives here are to refine the definition of KISS, and specify their mode of operation.

ANSA is the oldest of these three organizations. It was founded in

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[3] http://www.solidarites-actives.com/fr
[4] http://www.at-entreprise-pauvrete.org/
[5] https://www.rexelfoundation.com/en

2006 with the goal to "*participating in the implementation of social innovation and experimentation*".[6] By 2019, it employed 20 people and, since 2006, it has taken part in 47 social innovation projects throughout France. These projects are grouped by themes: (i) access to citizens' rights, (ii) access to health-care, (iii) food, (iv) governance and participation, (v) financial inclusion, (vi) digital inclusion, (vii) social and occupational integration, (viii) youth, (ix) housing, (x) inclusive mobility, (xi) early childhood, (xii) equal opportunities, and (xiii) social protection and support.[7] These projects and their corresponding actions cover the whole of France with variously scaled interventions - from municipalities to national level. ANSA is thus an actor having a broader scope of action than the local (Murray et al., 2010) and regional levels (Moulaert and Nussbaumer, 2014) documented in the literature. Moreover, its participation in 47 projects (despite its relatively short lifespan) suggests a high degree of professionalization.

ANSA is a specialist in connection: it provides social innovators with scientific and management methods, and connects them with public and private actors willing to provide financial and technical resources. All its employees are graduates, mostly in social and political science, and most have extensive prior experience in either the community, public or private sectors. ANSA operates like most consultancy firms, except that it specializes in social innovation and creates networks of actors to support the efforts of the social innovator.

Using a methodology put forward in Desmarchelier et al. (2016) and in Desmarchelier and Zhang (2018), we took the time-frames of these 47 projects as well as lists of the partners involved, to create adjacency matrices summarizing the linkages ANSA has built up over the years. By doing this, we came up with the hypothesis that all agents involved in a single project are linked. We worked with a list of 13 networks, from the period 2007 to 2019. As an example, Fig. 1 displays the network crafted by ANSA in 2019. Since, by definition, ANSA takes part in every project, it is at the center of this network and interacts with every agent. This central position is favourable to both knowledge accumulation and diffusion, and should also increase ANSA's capacity to establish new connections in future projects, as well as build its reputation within the network (Burt, 2001).

Descriptive statistics of ANSA's social innovation network are provided in Table 1. We observe that the number of actors involved in this network has grown markedly - from 4 agents in 2007 to 50 in 2019 - while the path length[8] remains fairly stable, contained in low values. For instance, in 2016 an agent chosen at random can reach any other agent in the network via only 1.84 intermediaries, on average. Such low and relatively stable path length, compared with the growing size of the network, is a sign of small-world effect (Newman, 2003; Watts and Strogatz, 1998): information (and potentially other resources) can circulate at high speed from one periphery of the network to another. This small-world effect is particularly strong here, since the network comprises a single component. The network's average degree (that is, the average number of links per node in the network) reveals ANSA's network-building activity. Indeed, in a standard consultancy firm, most clients would be linked only to their service provider. The network formed by such a company and its clients would thus have an average degree of one. However, in the ANSA network, an agent chosen at random had, on average, 3.14 links - or partners - in 2019 (see Table 1).

We note, however, that networks having particularly uneven connectivity (that is, networks having very few central actors) are particularly vulnerable to the defection of their most central actors (Albert et al., 2000). As an example, Fig. 2 provides a view of the same social innovation network as in Fig. 1 - but without ANSA. This network

is now composed of 15 distinct components, the largest comprising 11 agents - only 22.45 % of the total population of actors. Agents taken from disconnected components may still be interacting together elsewhere in the economy - either directly or via another connecting intermediary, such as a KISS agent. This undermines neither ANSA's network-building activity, nor this specific network's dependency on its most central actor. Such dependency can be a threat to sustainability of the network in the long run.

One apparent weakness of organized networks is their excessive dependence on the organizer. However, our study of social innovation networks reveals that they can be more resilient than expected. Indeed, they can also enter into contact with other such networks, to form larger and more self-organized entities.

The 2013 ANSA social innovation network is an exemplary intertwining network. Indeed, in that year, it became mingled with at least two other networks; these were initiated by Action Tank and the Rexel Foundation. Action Tank, founded in 2011, exists to help companies implement concrete "social business" initiatives (business activities dedicated to solving social issues, with all profits re-invested in the development of those activities).[9] Like ANSA, Action Tank employs a small, highly qualified, team. It provides companies with consultancy services to assist them in their social innovation projects. Lastly, the Rexel Foundation (established in 2013 by Rexel, a major distributor of electrical equipment) has three missions: (i) "*to improve access to energy for the most disadvantaged populations*", (ii) "*to promote socially-innovative solutions and models in the energy sector via a social entrepreneur joint-skills platform, which provides financial support through skills sponsorship, equipment donation and logistical assistance*", and (iii) "*to develop knowledge and raise awareness of energy efficiency*".[10] Both of these organizations provide consultancy services, resources and potential connections to social entrepreneurs. As such, they align with the above-mentioned definition of a KISS.

The ANSA network began interacting with the Action Tank and Rexel Foundation networks back in 2013. The resulting extended network between the three is shown in its 2013 and 2019 forms in Fig. 3. We note that in 2013, Action Tank and Rexel were interacting directly as well as through a variety of actors: banks (Caisse d'Epargne and La Banque Postale), industrial companies (Veolia and Bati Renov) as well as one actor in the social economy (ALEC Plaine Commune). The ANSA network is linked to the Rexel Foundation through the Schneider Electric Foundation. Unfortunately, this latter does not provide enough information to extend our adjacency matrix.

Interestingly, these intertwinings between the social innovation networks of ANSA, Action Tank and Rexel were not necessarily initiated by these three agents. In this way, a planned network can thus become more spontaneous or self-organized. Its evolution in terms of number of actors and connectivity cannot be fully controlled by the originating entity. For this reason, the extended ANSA network appears more resilient than the narrow version of it that was studied previously. As an illustration, Fig. 3(b) shows that the three sub-networks were even more inter-connected in 2019 - despite the disappearance of the Schneider Electric Foundation, which had been the third best connected node in 2013.

Descriptive statistics of the extended network are provided in Table 2. As with the narrow ANSA network, we observe that the growing number of actors does not result in a longer path length. Indeed, the path length is either stable or slightly reducing, moving from 2.79 in 2013 to 2.56 in 2019 - even though the number of actors has more than doubled. This suggests a high speed of information spread within the network. Average connectivity also rises from 2.96 contacts per agent in 2013, to 4.00 in 2019. Agents are thus benefiting from a growing pool of resources.

The resilience of the extended network can initially be assessed by the fact that it has never been disconnected over the years. Indeed, between 2013 and 2019, it always comprised one single component (see Table 2). In addition, the distribution of degrees among actors exhibits a fatter tail to the right in 2019 (see Fig. 4), indicating that an increasing number of actors are becoming central to the network. Fig. 5 illustrates this point by showing that the removal of ANSA (the most central actor) becomes less detrimental over time in the extended network. Indeed, the main component would still bring together 87 % of the actors without ANSA in 2019, compared to 77 % in 2013.

5. Conclusion

This paper argues that the social economy presents characteristics of both entrepreneurial and routinized regimes. For instance, its nonprofit nature makes patenting difficult, which favors entrepreneurial search. On the other hand, social innovation cases reveal that success demands a deep understanding of the needs and modus operandum of local communities. Such an understanding favors established actors - hence, a more routinized search.

Instances of entrepreneurial and routinized searches should, then, be common-place in the social economy. Yet social innovation literature tends to over-emphasize the stories of individual entrepreneurs. In this paper, we have documented cases of routinized search in which some agents specialize in providing knowledge, methods, social capital and funding to social innovators. In this sense, in the social economy, routinized search takes an interactive form. We term the agents driving this process KISS. These agents are similar to the well-known KIBS in that they are consultancy organizations - yet which nonetheless differ in several respects. The more obvious differences are that services offered by KISS organizations are for nonprofits "clients" and specifically target social innovation. The paper also documents an important difference in the way the two types of organizations operate. Whereas a KIBS firm generally engages in one-to-one relationships with its clients, a KISS organization typically invites third-party organizations (public, private or social). In doing so, the KISS are building growing social innovation networks.

In light of the empirical evidences gathered in this paper, the resulting networks are very much centered around their initiating KISS, leaving them vulnerable to the disappearance or defection of this agent. Yet interestingly, this vulnerability weakens over time, since social innovation networks are able to interact with others to form larger, more robust networks. Such interactions are not necessarily initiated by the initial KISS agent.

Entrepreneurial and routinized searches are being conducted in nonprofit activities, just as they are in every other sector. It is probably not the right moment to assess which behavior is responsible for the larger share of social innovation. However, a number of signs indicate increasing routinization. Indeed, in addition to the networks reported in this paper, some major research centers, like NESTA,[11] are transforming themselves into promoters and funders of social innovators. Likewise, for-profit consultancy firms like the Boston Consulting Group are offering assessment methods and road-maps to clients pursuing social innovation. Moreover, major companies are setting up foundations to promote and support social innovators, on condition that their objectives are consistent with the company's mission.

According to Baumol (2002), a distinctive feature of modern economic growth (in comparison with pre-19th century expansions) is the routinization of innovation. This routinization allowed the emergence of sustained trends of hitherto unseen productivity gains. In this context, national differences in education systems, R&D budgets, and in the relative importance of in-house R&D and contract laboratories (among other institutions) gave rise to different national innovation systems (Freeman, 1995; Nelson, 1993). It would be of interest to determine whether what we are witnessing in the social economy corresponds to the emergence of what we might call "national social innovation systems". If so, how these different systems influence national performance in terms of social innovation and beyond.

CRediT authorship contribution statement

Benoît Desmarchelier: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing, Visualization. **Faridah Djellal:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing. **Faïz Gallouj:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing, Funding acquisition.

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[11] The National Endowment for Science, Technology and the Arts (NESTA) was created in the UK in 1998, with the objective to "back promising individuals" and "technologies". It is now a charity which increasingly specializes in funding and supporting social entrepreneurs. (see: https://www.nesta.org.uk/blog/the-nesta-story/

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