

Developing the digital economy in France's rural regions: A new era for telecenters?

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Abstract

As the digital economy is becoming mature, public interest in telework is rising again. Since the beginning of the 2000s, many peripheral communities in developed countries have been showing a renewed interest for telecenters, facilities dedicated to the hosting and nurturing of teleworkers and IT-enabled small firms. These facilities offer IT gear and services that individuals and small enterprises could not afford such as DSL symmetrical telecommunications, a videoconferencing system, secretarial and concierge services. Although they have little macro-economic impact, telecenters are used as "living labs", parts of broader economic revitalization plans which endeavor to widen and strengthen the economic base of the community.

Keywords

Digital economy, telework, telecenter, rural regions, broadband networks

¹ A virtual community dedicated to rural telework, based in Low-Normandy, www.zevillage.net.

Résumé

L'arrivée à maturité d'une économie numérique a favorisé, dans les années 2000, un regain d'intérêt pour le télétravail. De nombreux territoires ruraux ont mis en place des télécentres, immeubles dédiés à l'accueil des télétravailleurs et des petites entreprises de service. Ces centres offrent des équipements informatiques et des services partagés (salle de réunion, visioconférence, connexion professionnelle à haut débit, service de secrétariat). Bien qu'il n'aient qu'un impact macro-économique limité sur le territoire, les télécentres sont utilisés comme des « laboratoires vivants », éléments de programmes plus larges destinés à élargir et renforcer la base économique des territoires ruraux.

Mots clés

Economie numérique, télétravail, télécentre, territoires ruraux, réseaux à haut débit.

Developing the digital economy in France's rural regions: A new era for telecenters?

Since the middle of the 2000s, we are witnessing a revival of public and private interest in telework and IT-based rural development policies. Although the concept was recognized as a global failure in the late 1990s, numerous communities have recently implemented telecenters, or are projecting to do so. The main purpose of this paper is twofold. First, it aims to explain the recent renewal of interest for rural telework and telecenters. Second, in the light of the analysis of current developments in France, it endeavors to provide an assessment of this policy.

1. The digital economy in peripheral areas

1.1. The revival of a powerful rhetoric

The relation between information technology (IT) and economic development in the rural regions of developed countries has drawn interest from many scholars (Grimes 1999; 2003; Malecki 2003; Moriset 2000; Rusten and Skerratt 2007).

The main problematic of rural IT may be summarized as follows:

- Peripheral areas face a structural penalty due to low density and remoteness from main business cities;
- Value chains have partly disintegrated and become digital (Malecki and Moriset 2008);
- In a "knowledge economy", business can be done "everywhere" (Malecki 2009), and, to a certain extent, it is actually done everywhere.
- Therefore, IT applications may be distance-killing tools which promise a "golden opportunity" to rural economies, thanks to the growth of telework.

Unsurprisingly, a "powerful rhetoric" has flourished around rural telework (Richardson and Gillespie 2000, p. 199). Forester (1988) writes about "the myth of the electronic cottage". Famous cyber-utopist N. Negroponte (1998) forecasts "a complete renaissance of rural living", and even the end of "the need for cities". Salomon (1998: 34) suggests that telework "offers a romantic image of returning to the pre-industrial family or community-centered society".

However, rural telework is not pure utopia. Some IT-enabled business is performed in rural areas. J. Kotkin (2000) explains why and how some members of the American creative class depicted by R. Florida (2002) are moving to much desired, rural areas. Beyers and Lindahl (1996) analyse the phenomenon of “lone eagles and high fliers” living and working in rural places. Clark (2000) and Moriset (2003) have matter-of-factly analyzed IT-enabled rural businesses, including home-based telework. In 2000-2001, the dot.com bubble bust and the subsequent economic downturn wiped out the media and public interest toward IT-related rural issues, in particular telework. Nevertheless, we are witnessing since the middle of the 2000s a revival of public and private interest toward telework and IT-based rural development policies.

Several indicators reveal this tendency. Governments have asked for reports in the field of telework (Ferhenbach *et al.* 2009, Morel-à-l'Huissier 2006), digital planning, and sustainable local development (DIACT, ACIDD 2009). Legislators have recently passed or submitted new laws aimed at favoring telework and IT-based economic development, especially in rural areas. On 8 April 2009, the French Parliament issued a new law aimed at the development of telework. Other countries show similar examples. On 28 October 2009, US Congressman Tom Perriello (Virginia's 5th district) introduced the “Rural and Small Town Telework Tax Credit Act” (Bill, H.R. 3627).

Recent documents show that the classic rhetoric of rural telework is stronger than ever. The home page of the *SoloSoho*² portal, in the green community of Gers (south-west of France) is telling in this regard: a woman is sited on the tiles, with a laptop on her knees, a cat curled up under her legs, children toys (including a farm tractor, by coincidence) lying on the floor, sunflowers in the corner (www.soho-solo-gers.com, accessed 9 September 2010). It is easy to understand that the worker on the picture is a mother of young children, precisely the favorite target of the pro-telework rhetoric. This picture endeavors to recall that telework eradicates the stress of urban, long commuting, is family-friendly, and is likely to reduce fuel consumption and carbon emission. As Handy and Moktarian (1996) pointed out, “telework promises something for almost everyone”.

² For Small Office – Home Office

Figure 1. The home page of the *SoloSoho* portal, www.soho-solo-gers.com



The revival of the telework rhetoric, notably in the rural context, stems from several factors. The late 2000s have seen the rise of environmental issues and the inflation of energy prices (in mid-2008, crude oil peaked at \$180 per barrel, from \$20 in the early 2000). In 2008, the world economic downturn has added new favorable conditions. It is worth noting that since the beginning of the crisis, the digital economy has been present in all recovery programs, *bail out* plans and other French "Grand Emprunt" (Juppé and Rocard 2009). Telework, and notably rural telework, have had their part. Western economies are in great need of creating jobs. Because rural labor pools are less costly, telework is considered as a valuable alternative to offshoring.

Meanwhile, the Internet society and the digital economy have become mature. In the late 1990s (the years of the dot.com bubble), the Internet society was still in the infancy. E-commerce was negligible, computers and telecommunications were expensive, and broadband for households and small businesses was almost non-existent. The profound change most Western countries have faced during the passed decade must be considered

plainly. From 2000 to the beginning of 2010, internet subscriptions in France (a country of 26 million households) rose from five to 20 million. In the same period, the share of broadband access rocketed from 5 to 97 percent (data: ARCEP³). Long distance telephone has become free of charge. Electronic shopping has become routine.

Therefore, there is some reason to consider that the level of "IT-readiness" of the country is far higher than in the 1990s. The end of the 2000s has probably marked a turning point. The following fact is revealing: according to S. Oziol, director of the Economic Development Agency of Lozère (a deeply rural community), for the first time in history, the General Council spent in 2009 more money for telecommunications infrastructures and digital programs than it did for roads".⁴

1.2. Rural telework: widening the economic base of local communities

Peripheral areas are characterized by a narrow economic base. Employment in farming and manufacturing has suffered from an endless decline. Public services are cutting jobs. Revenues are increasingly coming from a roster of non-productive activities which L. Davezies (2008) describes as elements of a "residential economy": tourism, health services. Secondary houses and elderly care facilities are flourishing.

This analysis is backed by data from the French National Rural Competitiveness Program, launched in 2006. It was endowed with a global funding of €240 millions, and leveraged a global public spending of €1 billion. By the end of 2009, 379 projects had been selected. These figures show the overwhelming domination of projects based on the primary sector, and tourism (table 1). Those based on manufacturing and advanced services represent a small number.

This narrow economic base poses a series of problems:

- Tourism favors part-time, seasonal employment;
- Secondary houses also favor a seasonal, part-time economy, and raise the cost of real estate to the detriment of the locals;

³ Autorité de Régulation des Communications Electroniques et des Postes

⁴ Interview by the author, 22 March 2010.

- College-educated, young people do not find suitable job opportunities in the area.

Therefore, locally born people who leave rural regions to study at university in a large city do usually not return in their communities. The result is a permanent brain drain, which in turn further hampers local development. A much important drawback is the lack of liquidity of the local labor market. With few, if any, jobs available locally, employees with a full-time working position (in the public or the private sector) avoid entrepreneurial risk-taking. Long tenures and low turnover favor sclerosis within companies and administrations (interview of S. Oziol, director of the Economic Development Agency of Lozère, 22 March 2010) .

Table 1. Sectors involved in the selected "*pôles d'excellence ruraux*" (PER)

Sectors	Number of projects
Agro-Food, Wood, Energy, Biomass	113
Tourism, Heritage, Culture	144
Health, Elderly Care	32
Education, other Public Services	19
Manufacturing	32
Business Services	8
Information Technology	8
Telecenters / Business centers	16
Others	7
Total	379

For policy makers and managers in charge of local economic development, the question is to favor the arrival of entrepreneurs from outside the region, and to spur local entrepreneurship. Given the rhetoric mentioned above, the development of telework and various kinds of IT-enabled business is an obvious target. A telework project in the Southern Alps explicitly mentions the diversification of the local economy. It even anticipates the crisis in the tourism industry which would arise from a future shortage of snow (the region has several ski resorts).

Through the development of information technology, the project endeavors to favor job creation in rural areas, to provide an alternative to the residential economy, to raise the occupancy time of secondary houses, and to anticipate forthcoming economic changes linked to global warming.

<http://teleactivites.leader-plus.com/>

2. The come back of rural telecenters

2.1. "New wine in old bottles"?

The concept of telecenter originates in the telecottages, which became popular in the 1990s, particularly in Scandinavian countries, and the UK. The first telecottage opened in 1985 in Vemdalen, in the north of Sweden (Bibby 1995). Telecottages were mainly technology access points open to a large public (Qvortrup 1989). They did not exclude business-related activities, but this was a secondary purpose. These facilities were aimed at the "digital empowerment" of citizens who, for diverse reasons (financial, social, geographic) had not access to digital technology on their own, or needed some training or technical help. French rural communities did not ignore this movement. For example, since 1996, the *département*⁵ of Ardèche has implemented a network of 26 "multimedia centers" (www.inforoutes.fr). In Spain, 4000 "telecentros" are open to a large public, for the purpose of training and raising the "IT-readiness" of citizens (www.telecentros.es).

In the aftermath of the dot.com bubble bust (2000-2001), public interest toward telecottages felt significantly. Many experiences in the UK and Scandinavian countries have failed. Grimes (1999) reports a similar fate for those located in Ireland. Richardson and Gillespie (2000) point out their "limited impact". In the USA, telecottages have always remained marginal (Blanc 1998). In the 1990s, the concept was backed by the low rates of IT equipment and Internet access throughout Europe and the USA. In the end of the 2000s, the commoditization of IT gear and broadband access for households has made public access points less necessary. For this reason, the telecenter concept, at least in Western countries, has now shifted to business purpose.

⁵ France's mainland is divided in 96 *départements*, organized in 22 *régions*. The *départements* are under the authority of elected General Councils. Their competencies include local economic development and infrastructures (roads and telecommunications network).

The revival of telecenters in France was initiated in 2005 by the "National Rural Telecenter Program", launched by the DIACT (now the DATAR), the planning and regional development arm of the French government. It issued a call for project named "Telecenters and tele-activities", targeting the creation by 2007 of 100 telecenters hosting a total of 1000 work positions (DIACT-DATAR 2006). This project was placed under the umbrella of the National Telecenter Network, a government-sponsored, non-profit organization created in 2004 (www.telecentres.fr). The program was funded with three million euros. Each project located in a Rural Revitalization Zone could receive 20,000 euros for 4 working positions and 2000 euros for each additional position. Some complementary funding could be received from the European Union, the Region, the General Council, and the Caisse des Dépôts⁶.

Many pundits regard this program as a failure. The actual number of telecenters which have actually been initiated by this initiative is unknown (the DATAR never made public the evaluation report), but it represents only a part of the 30 telecenters identified throughout France's rural regions (table 2). Anyway, we are far from the initial target of 100 centers and 1000 jobs.

Nevertheless, *La Gazette des Communes* titled in 2009: "a new start for telecenter networks". Indeed, several départements have successfully implemented networks of telecenters. In the years to come, the number of telecenters is likely to increase, given that many communities are planning or considering the creation of new telecenters. The Baronnies Provençales, a district in the south of Drôme, has ordered a feasibility study in 2010. The mostly rural département of Orne, in Low-Normandy, is planning a network of 10 facilities – two are already open in Boitron and Bellême, the later as a part of a newly labeled (July 2010) "pôle d'excellence rural" (Conseil Général de l'Orne 2010; De Mazenod 2010).

⁶ A State-owned institution dedicated to the financing of public projects.

Table 2. Rural telecenters in France (source: www.zevillage.net and author's research).

Département	Nb.	Municipalities (<i>communes</i>)	
Allier	1	Montluçon	www.centre-multimedia.com
Ariège	3	Lavelanet, St.-Lizier, Verniolle	www.teletravail-ariege-pyrenees.com
Cantal	7	Allanche, Aurillac, Chaudes-Aigues, Montmurat, Murat, Saint-Flour, Ydes	www.cybercantal.fr
Gers	8	Auch, Mirande, Nogaro, Mauvezin, Lectoure, Montreal, Riscle et Lombez	www.soho-solo-gers.com
Isère	1	Villard-de-Lans	www.vercors.org
Loire	1	Epercieux-Saint-Paul	www.zennit-telecentre.fr
Lozère	1	Mende	www.polen-mende.com
Nièvre	1	Lormes	www.nivernaismorvan.net/numerique
Orne	2	Boitron, Bellême	www.boitron.fr/telcentre/
Rhône	2	Bourg de Thizy, Saint-Mamert	www.teletravail-beaujolaisvert.com
Sarthe	1	Sillé-le-Guillaume	
Tarn-et-Garonne	1	Laguépie	
Hautes-Pyrénées	1	Saint-Laurent de Neste	www.cetir.net
Total	30		

2.2. What is a telecenter?

Telecenter remains a fuzzy concept. In France, however, the more or less official definition of "telecenter" describes business-oriented facilities, acting in some way as incubators or business hotels for teleworkers.

A telecenter is a working space hosting salaried and self-employed teleworkers. It comprises at least a private office space available for rent by the day, the week, or the month, shared equipments (computer, fax, photocopier, and broadband access) and services... The telecenter may be located in a multipurpose facility, such as an incubator, a community service house, a public telecottage... It may be used permanently or occasionally by salaried teleworkers from a remote company, by nomadic workers, and by self-employed, home teleworkers who endeavor to lessen isolation (DIACT 2006, author's translation).

This definition explicitly mentions the close presence of a telecottage or a "community service house". As a matter of fact, many telecenters are dual structures showing the coexistence of business and public services. The nature and structure of a given telecenter is typically an issue of geographic scale. In many rural areas, the market of teleworkers and service firms hosting is too narrow, and local communities cannot afford a complete set of business facilities.

In some medium-sized rural towns, the equipment shows the coupling of:

- A multimedia center open to the public, mainly dedicated to training and public use;
- A business center which mixes a telecenter space for teleworkers, and an incubator. It is common sense to understand why business and public access are not compatible and must preferably be physically separated.

In Montluçon (Allier, 40,000 inh.), the Chamber of Commerce has implemented a typical dual structure. The multimedia center (1500 m² of floor) offers two training rooms, one lecture hall of 180 seats, a videoconference facility, a library and documentation center, and meeting rooms. The neighbor business center (750 m²) includes 10 offices, a showroom, modular, multipurpose space, an open space for call center activities (12 seats) and a telecenter (50 m²) dedicated to teleworkers hosting.

A similar hybrid structure is showed by POLeN⁷, created in 2005, in Mende, the chief town of the département of Lozère (www.polen-mende.com). It is hosting:

- on the first floor, a telecenter (250 m²);
- on the ground floor, an incubator (200 m², 6 firms, 10 people).

Facilities implemented by smaller communities are usually smaller in size. The telecenter of Boitron (Orne, Low Normandy), created in a former primary school, offers one meeting/training room equiped with a videoconference system, two individual offices, and a reception/relaxation space.

⁷ For *Pôle Lozérien d'Economie Numérique*. The pun is interesting, given pollen plays a key role in fertilization processes. The example of the beekeeper and the fruit grower is commonly used by economic geographers to explain the concept of untraded agglomeration externalities.

3. The purpose and strategy of telecenter implementation

Many companies and government agencies would allow their employee to work remotely if they could confirm that their tele-offices are secure and meet the organization's working standards. A telework center may provide the necessary environment for enhanced collaboration that may require presence, or you may host your customers or clients frequently and wish to demonstrate a professional office environment (Officescape.com 2010)

Indeed, scale economies in the provision of a "professional office environment" are the very *raison d'être* of telecenters. These economies result from the sharing of business equipments and IT-based services that isolated teleworkers and newly born micro-firms could not afford. POLeN, for example, offers meeting room, training room, videoconference, photocopy, secretarial service, and some basic services such as computer aided publishing and web design. However, beside these technical features, three strategic issues may be identified: networking, telecommunications, and real estate.

3.1. Breaking isolation

Technical, commercial, and social isolation has for long been recognized as a major drawback of rural, home-based telework (Clark 2000; Moriset 2003). Therefore, social meetings may be regarded as an untraded benefit of telecenters. A.B. is a home-based teleworker salaried by a Parisian software company who lives near Aurillac, the capital of Cantal. He works two afternoons a week at the telecenter "to shift to another environment". C.D., a self-employed teleworker, acknowledges that the telecenter of Aurillac provides him some contact opportunities, and a more professional working environment. E.F., a self-employed person who works on a part-time basis in the telecenter of Murat (also in Cantal) says that "the goal is to leave home, to avoid isolation, to get in touch with other teleworkers; the center is a secondary workplace where he deals with clients". For G.H., also in Murat, "the presence of the telecenter guaranties business continuity in case of Internet blackout at home; he often goes to the telecenter for chatting. Had the telecenter not existed, he would never have created a business in

this place". The same person endeavors to "create a network of teleworkers in Cantal"(direct interviews, May-July 2010).⁸

These interviews show that telecenters provide not only tangible services and technical support, but also psychological support. Telecenters should be conceived as flexible exchange platforms, that teleworkers must be able to frequent on a part-time or an *ad hoc* basis. Therefore, the assessment of any telecenter-oriented policy should not embrace the metrics of the real estate industry in large cities which focuses on occupancy rates, but rather, must take into account the number of teleworkers whose it provides some support, although these people are not physically present on the site. By necessity, a telecenter *must* have a high vacancy rate. If a given telecenter is nearly full most of the time, it turns being an ordinary incubator which cannot play its role of a secondary workplace for teleworkers located in the neighborhood.

3.2. The telecommunications issue

At first sight, the provision of broadband telecommunications is among the most important services that telecenters offer to their users. The more speed and reliability a given business requires, the more it is likely to seek location in well-connected premises. Most telecenters, such as POLeN benefit from symmetrical, "business" DSL connections, between 2 and 8 Mbps. The new telecenter of Boitron (Low-Normandy) offers a 30 Mbps, symmetrical connection by WiMAX⁹, a record-breaking feature for a rural telecenter (www.boitron.fr).

This is a critical point. Many rural settlements throughout France still face a digital divide, with DSL connections often at the lowest end of the bandwidth spectrum, and sometimes even no broadband at all. As a matter of fact, Lozère remains in 2010 the French département the less served by broadband telecom (Moriset 2010). The first user of the telecenter of Bellême, in Low-Normandy (open in September 2010) is a freelance photograph and journalist who cannot get ADSL at home (Caffarelli 2010).

⁸ People have requested anonymity. The initials have been changed, the male gender is used by default.

⁹ Acronym for Worldwide Interoperability for Microwave Access, a long range, terrestrial radio waves telecommunications system. WiMAX offers a symmetrical bandwidth up to 50 Mbps at a distance of 10-15 km under direct sight from the transmitter.

In the near future, this argument could be compounded by the advent of optical, ultra high-speed broadband telecommunications, allowing symmetrical bandwidth exceeding 50 to 100 Mbps. At the present time, FTTH (fiber-to-the-home) is still in the infancy in Europe. France has merely 300,000 subscribers, who are living in central districts of large cities. In small and medium towns, neither households, nor SMEs, have final access to fiber. The "last mile" connection remains in copper wire. Only large firms with great bandwidth needs can afford a private FTTP (fiber to the premises) service.

Individuals and small firms located in low-density areas cannot expect to get optical telecommunications in the foreseeable future at competitive prices. Rural areas face the advent of a "digital divide 2.0" (Moriset 2010).

Therefore, the availability of FTTP or WiMAX connections in telecenters may become a critical asset for small enterprises and rural teleworkers. However, the provision of advanced telecommunications might imperil the concept of telecenter described above, as a support platform used mainly on a part-time or *ad hoc* basis. It is far from certain that high-speed connection can conveniently be a part-time service. If they cannot get it at home, teleworkers with great bandwidth needs would need to work permanently in the telecenter, which, in the end would fall in the category of ordinary incubators and business parks. The definitive scenario will depend, in the end, from the kind of business which is performed, and from the future evolution of the bandwidth demand by e-business.

3.3. Tourism vs. Telework? The issue of business property and real estate

Malecki and Moriset (2008, p. 200) write "there is a great probability that the emergence of the digital economy will favor high-amenity rural areas. Further empirical investigation suggests a more mixed figure. The rise of tourism and secondary houses may be a deterrent or a competitor for IT-based industries. P. Vollaire, chairman of a small software company and deputy-mayor of Gap, in the French Southern Alps, considers that "with 40 ski resorts in the area, people do not see the importance of creating new businesses in the IT-enabled sector, but have only in mind to increase the value of their real estate".¹⁰

¹⁰ Interview by the author, 15 March 2010

However, the worst effect of tourism is perhaps the continuous inflation of property prices, and the recurrent scarcity of land approved for building. This prevents would-be entrepreneurs and newcomers to locate their business at reasonable prices, and to house themselves and their family.

For example, the average rental fee in the Micropolis Business Park in Gap is around €130 / m² annually. POLeN in Mende, and the "village d'entreprises" in Aurillac, show similar prices: around €120 /m². In the nearest metropolitan areas, Montpellier, Marseille, and Lyon, there is abundance of rental office space at similar price, new or renovated. Only Paris is much more costly.

During the two last decades, the arrival of retirees, French or foreign, the increase of secondary houses, and the enforcement of restrictive land development regulations have sharply raised housing cost. Although by no means as expensive as rural England and Germany, rural France has actually ceased to be a place where old stone-made farmhouses can be found at derisory price.

When people establish in a so rural district, they do not seek to live in an apartment block, but rather in an old, stone-made farmhouse. But there is nothing for sale at reasonable prices.

The director of the business park POLeN, Mende, Lozère.

As a result of this "property bubble", rural regions have lost a part of the build-in advantage they had over large cities (with the exception of Paris). On the other side, firms in the tourism industry, notably hotels and self-catering apartments, are growing customers of IT services (for example the creation and maintenance of web sites). Vacationers, according to local representatives, are increasingly demanding of Internet and 3G mobile connections. This demand, in turn, spurs the implementation of broadband in rural areas, and the growth of local IT service firms.

In the end, in some regions, telecenter developments might be encouraged as a tool to counterbalance the effect of the real estate bubble, given teleworkers usually pay a very low rental fee, or no fee at all, at least during the first two years after creation. When telecenters are build on green fields, such as POLeN in Mende, the cost of land raises the public investment. But local communities have plenty of opportunities to refurbish old buildings (closed schools, former factories etc.) suitable for telecenter creations.

4. Community networks of telecenters: an issue of regional planning

Although a single, well-equipped facility in the chief town of the territory, such as POLeN in Mende (Lozère), may attract and retain some teleworkers and small firms, it is almost useless as a tool for economic development on the full scale of large rural département, where distances can be counted by the hundred of kilometers. In mountainous regions, the problem is compounded by small roads, often icy and snowy in winter.

In order to make it possible, for home-teleworkers and nomadic workers, to have easy access to telecenters (20 km. for example), a dense coverage of the territory by a network of facilities is required. A small number of leading départements have already implemented networks of telecenters, especially Cantal, in the Massif Central, and Gers, in the south-west. Others, such as Orne, in Low-Normandy, are following this way.

4.1. The telecenter program in the département of Cantal

Cantal is located in the Massif Central. It hosts 149,700 inhabitants, who live in 260 towns and villages, spread over 5,726 km² of scenic mountains and hills. Cantal is not served by any highway or TGV train. The nearest university city (Clermont-Ferrand) is a two-hour drive far from the chief town, Aurillac.

Its small airport offers 2 daily flights to Paris (1h.20'), the easiest way to reach a large city. Remoteness is compounded by rugged terrain and snowy winters. But the region's unspoilt countryside has much to offer to nature lovers and outdoor recreation fanatics.¹¹ Because of such isolation, and seeking to take advantage of its environmental asset, Cantal has developed an active telework policy (*L'Union du Cantal* 2008).

The département's first digital program was launched in 1998, with the dissemination of computer and Internet access points in 200 villages. In 2004, 23 main towns and villages received the implementation of public Internet access points, connected by satellite broadband. Meanwhile, enterprises received subsidies to develop e-commerce (50% of Web sites development costs). Telecenters are part of the latest digital program,

¹¹ Hunting, fishing, hiking, biking, cross-country and alpine skiing, etc.

launched in 2009, which focuses on e-education, e-administration, and telework.

Seven telecenters are now completed. 300 candidates have received some business training and advice, and 30 have actually created a business. Four telecenters have a videoconference facility. However, this service is not used much by teleworkers and companies, but rather by individuals for the purpose of virtual meetings at the national employment agency, or the Child Benefit and Health Office in Aurillac, the main town. Four telecenters offer an 18 Mbps ADSL connection (download), which is the normal standard in France; three have a 2 Mbps, symmetrical (SDLS) business connection¹².

A circle of 18 km radius contains a hexagon of about 840 km². Seven figures of this size cover a Christallerian area of 5,900 km², which slightly exceeds the surface of the département, 5,726 km². Therefore, taking into account the uneven terrain and the unequal density of population, it is reasonable to consider that a vast majority of Cantal's citizen is living well within a 20 km, one-way trip from one of the seven telecenters.

4.2. Toward "virtual" telecenters?

The telework policy in the département of Gers has materialized in a network of eight telecenters backed by an electronic directory of 271 teleworkers (including those present in the telecenters), www.soho-solo-gers.com. This portal's main purpose is to favor the networking among local teleworkers, and the generation of a "virtual cluster" effect. Actually, many teleworkers and small firms present in a given rural community may exchange services. If a local web designer needs some secretarial service, or accountancy or legal expertise, it would be a pity to buy it in Paris or in Lyon if it may be provided by a small business located in the nearby village. This said, local service firms are not (and should not be) bounded to a local market.

Upgraded technology makes it possible to conceptualize a more advanced concept, which is not a simple virtual network, but an actual virtual telecenter. This solution has been developed by a small service company

¹² Source: interview with S. Medzianowski, General Council of Cantal, director of the CyberCantal program, 29 March 2010).

located in Southern Drôme, *Internet 3 Solution*. Users of the virtual telecenter are invited to create avatars which constitute the interface with other users, through immersive, 3D technology. The concept is somehow close to those of Second Life.

We are looking for ten local communities to launch a "network of new generation telecenters", using 3D, immersive, and virtual reality technology. Costs are lower, no travel to work is required, and any DSL line allows social and convivial connectivity. Enterprises may share 3D, interactive contents with their employees. Tens of collaborative tools are available. Everybody can arrange his personal workspace, without space and cost limitations. Subsidies from the European Union and the region are possible (Denis 2010, author's translation).

Although this solution has some appeal, there are two services that a virtual telecenter will never provide: advanced telecommunications, and face-to-face social contacts, which is a major benefice provided by "brick-and-mortar" telecenters.

5. Discussion

Are telecenters worth the price?

Large or small, telecenters rely heavily on public funding. Most rural areas (especially those located in "rural revitalization zones") benefit from a large array of public subsidies. In addition to the local community effort, telecenters' financial roundtables usually include the European Union, the French State, the Region, and the General Council (Département), which often cover three quarters of the initial investment. Rental fees hardly cover operating costs. Therefore, there is some reason to cast doubts about the relevancy and the efficiency of such programs.

The existence of many programs is explained by the conjunction of the bargain effect and the bandwagon effect. There is public money to spend, and communities which apply to funding projects get it, while the others do not. The action of the digital lobby must also be considered: these projects may act as springboards for policy-makers, local elected representatives, specialized consultants, and big IT industries which sponsor and publicize

small, but popular operations. This is the consequence of the powerful rhetoric described in the first part of this paper.

Telecenters are a popular cause in several milieus because they materialize the anchorage of the community in a digital knowledge economy. Telework is normally the field of invisibility (Hillis, 1998). In rural areas, there is nothing that resembles office buildings which tower over business city landscapes, and epitomize economic power and modernity. Home-based teleworkers are hidden, even their number is unknown. But local and national policy makers want to see official inaugurations of "brick-and-mortar" reported in newspapers, in order to show taxpayers and voters the materialization of telework-friendly policies.

Probably a good idea, but it is not "green"

Despite their flaws, rural telework and telecenters may be a valuable concept, and policies in the field – local rather than national – deserve to be encouraged. But the "green" argument should be rebutted. First, rural life in general is highly energy-consuming and carbon dioxide-emitting. Most people live in individual houses, often poorly insulated, rather than apartments. Given that public transit is usually non-existent, they rely on car for every travel purpose. If we look at low-carbon communities, the model is Hong-Kong or Singapore, not rural areas. And telecenters, by the virtue of their existence, could erase the environmental advantage of home-telework, which relies on the suppression of the journey-to-work: a teleworker who drives 10 to 20 km to reach the center, admittedly on a part-time basis, produces more carbon dioxide than a city-dweller who takes the metro.

However, the goal of telecenter creation is not the reduction of carbon emission, but the revitalization of the local community, through the attraction and retaining of college-educated people working in the knowledge economy. It must be recalled that, in many rural villages, some services do not exist, or are near the lowest limit of viability: bakery, grocer shop, primary school, doctor, postal office etc. A few more families could make all the difference, with a virtual circle effect. The result may be the global enhancement of quality of life for the whole population. In this regard, telework may be critical for the attraction of working couples – a major issue of recruitment in small labor pools. A community which tries to attract a doctor will face the problem of the employment of his/her partner.

A telecenter may raise the argument in favor of the telework solution. This is not a theoretical case study. The telecenter of Aurillac hosts a salaried teleworker who left Paris when his spouse, a professor, was recruited by a local primary school (interview, 11 May 2010).

Finally, much remains to be learned from today's telecenter developments in Cantal, Gers, or Orne. These départements act as pioneers, and numerous rural communities are waiting for a strong feedback from the experiences in progress, which might be regarded as "living labs" of the digital economy in a peripheral context.

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