

# **Smart Communities and Knowledge Sharing** as Main Tools to Achieve Common Purposes

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**Abstract.** As reaction to globalization and the loosing of landmark caused by the huge data and information availability in the "net" and by the mass media proliferation, the research of an identity and the need of a feeling of belonging is stronger and stronger in today society. The information and communication technologies (ICT's) - which initially helped to erase socio-territorial boundaries and to strengthen a feeling of belonging to a single community in which we are all interlinked and interdependent - have now become the main tools for building local, and smart, communities. These, in addition to being places of confrontation, are also and above all places for sharing subjective and objective knowledge (and therefore for continuous learning). There are several experiences going towards this direction (i.e. creating shared spaces built around shared values that emerge to deal with problems felt as "public") ranging from analytical, investigative, critical and vindictive dimensions to proposals, monitoring, evaluation, deliberation, on the most varied topics: from the abandonment of public buildings (such as confiscated property), to security and the protection of territories. These are thus defined spaces in which, through self-organization and civic hacking dynamics, problems that are perceived as public are discussed and public goods are co-produced. These last are intended not as goods produced or owned by a public administration, but as the result of a process of social interaction. Digital technologies in this contest are tools by which social practices of re-appropriation and collective redefinition of public goods are nourished.

**Keywords:** Social interactions · Digital technologies · Smart communities

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#### 1 Introduction

"The best ideas are common property" (Seneca)

In the presidency conclusions of the Lisbon European Council (March 2000) [16], the first sentence in the chapter "Preparing the transition to a competitive, dynamic and knowledge-based economy" was "an information society for all".

The Lisbon Council issues were defined in 1999 in a document which motivates the need for *e*Europe as follows [6]:

Why *e*Europe now? *e*Europe [9] is a political initiative to ensure the European Union fully benefits for generations to come from the changes the Information Society is bringing. These changes, the most significant since the Industrial Revolution, are far-reaching and global. They are not just about technology. They will affect everyone, everywhere.

Bringing communities, both rural and urban, closer together, creating wealth, sharing knowledge [1, 14, 26], they have huge potential to enrich everyone's lives.

And the same document defines key objectives of eEurope:

- Bringing every citizen, home and school, every business and administration, into the digital age and online.
- Creating a digitally literate Europe, supported by and entrepreneurial culture ready to finance and develop new ideas.
- Ensuring the whole process is socially inclusive, builds consumer trust and strengthens social cohesion.

Starting from these statements, we may understand how innovation and technologies can (and must) support sharing of knowledge and inclusion.

## 2 Innovation and Knowledge Diffusion

Knowledge sharing is closely linked to innovation and in particular to its dynamics, namely the processes that lead to its diffusion. This theme has been and still is at the center of the theoretical debate. An invention, that is, the purely creative act, which does not turn into an (product, process, organization) innovation does not have economic value and therefore does not produce effects on the socio-economic system. An innovation that is adopted by a few other players produces limited effects. The more widespread an innovation is, the more effects it produces. The theoretical models and approaches differ according to whether they identify linear processes and sequences over time (the phases follow one another in sequential order) or non-linear (interactive models with feedback from one phase to another).

Nonlinear models, developed starting from systemic theory [15, 22, 34] emphasize the interactions between actors, competences, knowledge and information flows that distinguish the different phases of the innovative process. In these models the central role is played by knowledge, skills (especially tacit) and learning processes that arise from the contact of people and the knowledge and skills incorporated in them.

In traditional theoretical models of the innovation economy, the representation of the innovation diffusion is an S-shaped curve. This representation is inspired by the theory of the product life cycle, characterized by an introduction phase, a development phase, a maturation phase and a decline phase. Likewise, an innovation or a new technology would know an introduction phase, a slow growth phase, a rapid growth phase and a maturity phase (which can also lead to a decline of innovation unless subsequent improvements). If the first phase can be characterized by radical innovations, the subsequent ones are mostly characterized by incremental and adaptive innovations.

The S-shape and above all the times of the different phases and the slopes of the different arches are influenced by various factors. The times of introduction (of adoption of a new product or of a new production technology) vary from innovation to innovation and from technology to technology, from enterprise to enterprise from society (of individuals) to society (of individuals). The same is true for large-scale deployment times. The S-curve could therefore take very different forms. Among the models that have attempted to explain the mechanisms for spreading innovation we find the one centered on the idea of imitation. This model transfers the epidemiological model of propagation developed in the medical sciences to the social sciences. The diffusion would take place by contagion (given by physical proximity and contacts between people) according to a speed of diffusion that varies according to the technology, the sector and the market.

Still on the topic of dynamics, a particularly important problem is that of technology transfer (particular method of spreading innovation and knowledge).

Technology transfer is the result of a set of operations that lead a company to "move" the point of application of a technology to a) another company (also a branch); b) to another country through the sale of its know-how and technical assistance. Technology transfer can be differentiated into:

- transfer of technical elements (machines, infrastructures, ...)
- transfer of techniques in the strict sense (machines, production processes, with related user manuals, ...)
- transfer of techniques in a broad sense (transmission of know-how and training)
- "global" technology transfer (the three previous components jointly)

The complex nature of technology undoubtedly explains one of the greatest difficulties of technology transfer, to the extent that this transfer does not imply, in the majority of cases, the modification or delocalization of the whole of the technological structure, but only of some of its elements. The success of the technology transfers, on the other hand, would require a shift of all the components of the technology (material, informative and organizational elements).

Since this rarely happens (in particular specific knowledge and know-how are difficult to transfer), those who "receive" technology are always in a position of dependence.

The transfer of knowledge opens a controversial chapter, that of protecting the rights of those who produce it: intellectual property rights (IPRs). Nowadays, the wealth of nations no longer resides in the earth and gold, but in knowledge. The ownership of factories, mineral reserves, properties and gold is quickly replaced by the ownership of intellectual products or "intellectual property".

Studies on the effects of IPRs on economic development assume knowledge as a non-competing asset. Consequently, the production of knowledge is associated with a higher rate of social return than the private one, thus determining a systematic under investment in knowledge. The political choice to solve the problem was to grant the "knowledge producer" the possibility of selling his innovation temporarily exclusively (e.g. patents, trademarks, copyrights). The idea behind this protection would stimulate innovation by guaranteeing a short-term monopoly associated with an improvement in long-term social well-being. The trade-off between the short and long term allows to derive the optimal length of the IPRs [7]. The IPRs system varies significantly from country to country. The level of protection of IPRs in a given country can be explained by associating it with its level of economic development and its historical and cultural path [30].

Least developed countries offer the lowest standards of protection for their lesser capacity to create innovation and have therefore traditionally preferred a rapid dissemination of knowledge at the expense of protecting IPRs. As countries rise on the scale of development, they adopt higher standards of protection both because they have more resources dedicated to the creation of innovation and because they represent more attractive markets for the more advanced countries and therefore face increasing pressures for protection from the outside. IPRs are therefore now part of the institutional infrastructure of developed countries as they aim to encourage private investment in research and development (R&D) and in other inventive or creative activities.

Many of the developed countries have pushed towards greater protection of intellectual property rights (Intellectual Property Rights - IPRs) through bilateral, regional and multilateral actions. In this context, the Agreement on Trade Related Aspects of Intellectual Property Rights, including Trade in Counterfeit Goods (the TRIPS Agreement), negotiated during the Uruguay Round (1986–94) of the trade negotiations, emerged as one of the three multilateral agreements (together with GATT and GATS) which outlined the fundamental structure according to which the World Trade Organization (WTO) operates. The TRIPS Agreement is based on pre-existing international conventions but in addition establishes minimum protection standards for all forms of IPRs and establishes procedures in the event of disputes, also providing for multilateral sanctions in cases of non-compliance with the rules laid down in the agreement.

The argument that is often proposed in support of this globally uniform regulation of intellectual property law is that such a system of rules would favor investment, research and technology transfer in developing countries.

However, some authors [5, 8, 24] believe that with the TRIPs Agreement the international monopoly of "knowledge producers" has been increased to the detriment of consumers, generating a distribution conflict between the North (innovator and knowledge producer) and the South (consumer of knowledge and technology). According to this approach, in terms of distribution of social well-being [29] the North, by increasing its level of monopoly, determines a very serious imbalance by extracting a part of the surplus of the South.

Based on these considerations, the South will tend to adopt a less restrictive IPRs policy than that of the North, indirectly supporting imitation and playing a global free-rider role rather than supporting a IPRs policy harmonization program.

Starting from even more radical positions, Vandana Shiva [31] argues that the birth of intellectual property rights is linked to the attempt by more developed nations to use them as the main tool of their own economic growth and for the control of world trade and markets International.

In this scenario, the digital revolution has led to the appearance of a new protagonist: the Creative Commons licenses.

Creative Commons are an important cultural and legal phenomenon, thanks to which the principles of copyleft born in the IT field (Free and Open Source Software) have expanded to creative works in general (open content). Creative Commons is a project born in the USA which belongs to a non-profit association (based in San Francisco) and which is structured in a series of decentralized communities scattered around the world.

Creative Commons (CC) licenses are based on copyright and apply to any work protected by it. The fundamental prerequisite for being able to grant a work under a Creative Commons license is to be the owner of all the rights granted with the license or to have an explicit authorization/request from the owner of the rights (for example the publisher).

Creative Commons licenses allow the author to define the rights that the author reserves towards the users of the document, according to the "some rights reserved" model.

Creative Commons licenses are ideally structured in two parts: the first part indicates the freedoms granted by the author for his own work; the second, however, exposes the conditions of use of the work itself.

The two freedoms are:

Share  $\rightarrow$  Freedom to copy, distribute or transmit the work Reworking  $\rightarrow$  Freedom to readjust the work

The conditions of use of the work, which the user of the work must undergo in order to be able to use it freely, are four (Attribution; ShareAlike; Derivatives; Non-Commercial) and each is associated with a graphic symbol in order to make it easier to recognize. The combination of these four clauses gives rise to the Creative Commons licenses in use (Table 1). Once applied, the Creative Commons license is irrevocable.

## 3 Open Source, Open Data, Communities and Influencers

When speaking of "knowledge sharing" in the world of digital technologies, one might certainly start from the great experiences of the free software and open source communities or, for simplicity, FOSS (Free and Open Source Software) to avoid the error, unfortunately still common, of understanding "free software" as costless software while the word free in this context derives from freedom, and above all freedom to share [20].

Table 1. Creative Commons License

Sigla	Descrizione
CC BY	It allows you to distribute, modify, create works derived from the original, even for commercial purposes, provided that the authorship of the work is recognized to the author
CC BY-SA	It allows you to distribute, modify, create works derived from the original, even for commercial purposes, provided that the authorship of the work is recognized to the author and that the new work is given the same licenses as the original (therefore each derivative will be commercial use allowed)  This license, in some ways, can be traced back to the copyleft licenses of free and open source software
CC BY-ND	It allows you to distribute the original work without any modification, even for commercial purposes, provided that the authorship of the work is recognized to the author
CC BY-NC	It allows you to distribute, modify, create works derived from the original, on condition that the authorship of the work is recognized to the author, but not for commercial purposes. Anyone who modifies the original work is not required to use the same licenses for derivative works
CC BY-NC-SA	It allows you to distribute, modify, create works derived from the original, but not for commercial purposes, provided that the authorship of the work is recognized to the author and that the new work is attributed the same licenses as the original (therefore to each derivative commercial use will not be allowed)
CC BY-NC-ND	This license is the most restrictive: it only allows you to download and share the original works on condition that they are not modified or used for commercial purposes, always attributing the authorship of the work to the author
CC Zero (CC0)	With a CC0 license, the author knowingly renounces all rights to his work. The functioning and effectiveness of this type of license depends on the type of work and the relative current regulations, but in general it acts as an unconditional waiver of one's rights to his work, which automatically becomes public domain

But let's see the definition given by the Free Software Foundation [10]:

"Free software" means software that respects users' freedom. Roughly, it means that the users have the freedom to run, copy, distribute, study, change and improve the software. Thus, "free software" is a matter of liberty, not of price. To understand the concept, you should think of "free" as in "free speech," not as in "free beer".

We sometimes call it "libre software," borrowing the French or Spanish word for "free" as in freedom, to show we do not mean the software is costless.

Below is the definition of free software freedoms (https://www.gnu.org/philosophy/free-sw.html.en#f1):

A program can be defined as "free software" if the program's users have the following four essential freedoms:

- The freedom to run the program as you wish, for any purpose.
- The freedom to study how the program works, and change it so that it does your computing as you wish. Access to the source code is a precondition for this.
- The freedom to redistribute copies so that you can help others.
- The freedom to distribute copies of your modified versions to others. By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

It is therefore evident that the sharing of knowledge is the basis of free software and the communities that were born around these principles are communities that share, often as volunteers, time and skills.

Thanks to the type of licenses with which it is released and the collaborative methods with which it is developed, open source software becomes an innovation enabler contributing to the technological independence of Europe and the development of European companies. It is no coincidence that the European Parliament already on 29 October 2015 issued a resolution that "calls for the systematic replacement of proprietary software by auditable and verifiable open-source software in all the EU institutions".

Many European countries then followed up on this resolution with national regulations.

Public Administrations (PAs) buying software have to ensure the respect of many different constraints at least from the legal, technical and economical points of view.

Nevertheless PAs cannot forget that they are spending public money for the public interest, so they also have to ensure the respect of some "common" rules.

The development of technologies can be seen at least from three different points of view:

- technical: computer technologies (hardware and software) are more and more evolved and responding to customer requirements and needs
- easiness of use: evolution of technologies has brought simplification of interfaces and of man machine interaction tools
- economical: strong enhancement of the price/performance ratio

Technologies are evolving very fast and not always democratically; the risk is that too few suppliers control the market making technologies an instrument of power rather than a tool for progress.

Many population groups are weaker for social, physical, age, gender, income or culture reasons. For these groups access to technologies is not insured simply by technical evolution.

The role and the vision of politicians and an appropriate choice of policies are essential to lower the digital divide and to fill the gap between technologies and citizens giving people the full capacity to control and use new tools and avoiding the risk of new monopolies.

PAs can turn risks into opportunities, granting to citizens and enterprises the reduction of discriminating conditions and making them participate to economical, technological and social evolution processes.

In this phase PAs and in particular the local PAs have big duties and big opportunities to act in the direction of bridging the digital divide [19]!

#### PAs in buying software must assure:

- Pluralism, competition and security
- Integration with the software already in use
- "Continuity" of data (possibility of reading data also in the future)
- Interoperability and cooperation
- Availability of source code at least for inspection and traceability (even in case of proprietary code)

#### PAs in buying software must:

- Be proprietary of the "structure of data"
- Get better price/performance solutions
- Get a good price/performance maintenance
- Verify the TCO (Total Cost of Ownership and possibly the Social TCO)
- Buy software based on Open Standards
- Be sure to be able to change software supplier (paying attention to avoid lock-in)
- Be sure that the software acquired will not have any "backdoors"

#### In giving information, PAs must grant to citizens

- Transparency
- Privacy (GDPR)
- Accessibility (both in the sense of availability of documents and in the sense of accessibility for people with disabilities)
- Possibility to read public documents without having to buy any software (or license)
- Possibility to export data and documents in open formats
- Open Government Data

#### How can this be done[18]?

Most of the previous requirements can be easily obtained by adopting:

- Open Standards (OS)
- Open Source Software (OSS) solutions, but, in some case, it is essential that adoption
  of OS and OSS solutions be made compulsory by law in order to grant that the
  following requirements be totally satisfied:
  - Efficient and easy interoperability
  - Extended reusability of software and solutions [23]
  - Permanent access to data and information (Open Government Data)
  - Independence from suppliers
  - Verifiability of content and procedures

And what is the advantage for citizens? Acquisition of FOSS by PAs may help in:

- reducing the digital divide
- increasing internal ICT competences and forming communities among PAs
- favouring sustainable economic and social development of the territory

Beyond this minimal and common level of requirements, each Administration will be able to adopt its own policies adding more compulsory rules like, for instance, the following:

- PAs when buying software developed on their own specifications have to acquire the source code and be proprietary of it;
- PAs owning software developed on their own specifications, have to give it for free with the source code and documentation to any other PA that can adapt it to its own needs.

#### 3.1 Open by Default!

Speaking about openness, it is clear that Open Data [2] is also the basis for knowledge sharing: "Open data is data that can be freely used, shared and built-on by anyone, anywhere, for any purpose." (Open Knowledge Foundation)

The key features of openness defined by the Open Knowledge Foundation are:

- Availability and access: the data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form.
- Reuse and redistribution: the data must be provided under terms that permit reuse and redistribution including the intermixing with other datasets. The data must be machine-readable.
- *Universal participation*: everyone must be able to use, reuse and redistribute there should be no discrimination against fields of endeavour or against persons or groups. For example, 'non-commercial' restrictions that would prevent 'commercial' use, or restrictions of use for certain purposes (e.g. only in education), are not allowed.

In 2009 President Obama in a Memorandum declared:

"My Administration is committed to creating an unprecedented level of openness in Government. We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in Government."

Open Government, Open Data, Open Access, Open Source, Open Standard, Open Innovation (H. Chesbrough) and any other way of sharing and collaborating without the "owner attitude" are the only way to ensure sustainability replacing the pernicious Not Invented Here syndrome (NIH) with Proudly Found Elsewhere [6]!

There are many examples of collaboration [21] in these areas and perhaps the best known worldwide is Wikipedia [35].

"Wikipedia is a multilingual online encyclopaedia created and maintained as an open collaboration project by a community of volunteers using a wiki-based editing system ... Initially an English-language encyclopaedia, versions of Wikipedia in other languages were quickly developed. With 6.1 million articles, the English Wikipedia is the largest among the more than 300 Wikipedia encyclopedias. Overall, Wikipedia comprises more than 53 million articles attracting 1.5 billion unique visitors per month."

In some ways even social networks can be used as tools for the immediate sharing of knowledge even if this obviously implies less scientific rigor of information.

Finally, bloggers and influencers are another important vehicle of communication and knowledge sharing but, of course, they are going to tell us what they want to show us from their own point of view.

In summary, technologies are a great tool for sharing knowledge, and visions and policies can and must be a tool to encourage it.

## 4 Digital Sharing for the Territorial Fruition

Communities can take advantage of the forms of sharing made possible by new technologies to strengthen their resilient response to the shocks and stresses to which they are subjected: together with the traditional environmental, social and economic dimensions of sustainability, the literature also recognizes the important role played, in particular, by GIS tools [4], and especially by web mapping solutions.

Although traditional (paper) maps are still a vital source of information for the use of the territory, the context of GeoWeb 2.0 [17, 36] has opened up new perspectives that were largely unexplored until a few years ago. Technological advances such as the introduction of AJAX [11], the massive use of GPS and the spread of OGC standards for the interoperability of web mapping [25] have ushered in the era of neogeography [34], in which users become producers (and no longer pure consumers) of geospatial data. In this phase, defined by Plewe [28] as the third generation of web mapping, applications have become interactive and usable as their desktop counterparts <sup>1</sup>.

The fourth generation of web mapping has focused on three-dimensional virtualization of the Earth's globe such as Nasa World Wind, Google Earth and Microsoft Bing, offering users a more realistic and engaging experience. The advent of these public web services with global coverage of digital images has opened up the world of geospatial mapping via the Internet to the world community. The ability to generate maps has extended far beyond the small group of web developers and mapping experts [27].

Examples of such applications related to Italian slow tourism include: slow itineraries in Italian parks (http://www.parks.it/itinerari/Eindex.php); GiroParchi, which shows nature trails through the Gran Paradiso National Park and the Mont Avic Natural Park in Val d'Aosta, Italy (http://www.giroparchi.it/it/map/wrap); the Web viewer Contrat de Rivière Haute-Sûre, (http://www.crhs-sig.eu/mapserver\_crhs/index.php?lang=en); Via Alpina, centered on a series of slow tourist routes along the Alps (http://www.via-alpina.org); the Swiss national portal for slow tourism (http://map.wanderland.ch/?lang=en); one web viewer on the most interesting slow tourism routes in Europe (http://maps.peterrobins.co.uk/routes.html) and another on the Via Francigena (http://www.viefrancigene.org/en/map).

Following the idea of Plewe's four generations of web mapping, Tsou [32] described a fifth generation based on cloud computing, advanced Internet applications (Rich Internet Applications - RIA)<sup>2</sup> and crowdsourcing. Instead of striving for ever more powerful hardware and increasingly sophisticated software, users can access cloud computing and cloud storage resources and services. Web mapping solutions, which integrate crowdsourcing data from users, allow users to be much more involved in the applications themselves. It is therefore evident that the center of the development of web mapping goes beyond information and data and substantially concerns the interactions of people on a global level.

User participation has also been the enabling factor for neogeography and is traditionally associated with the definition of Volunteered Geographic Information or VGI [12].

Consistent with this perspective, according to [13], the network initially appeared as the network of documents, was then transformed into a network of people and is now developed as a data network and social networks, through which they create real smart communities: in other words, communities are enriched by the contribution of users thanks to the support of new technologies and the network. The latter web transition focuses on a stronger connection involving people and data, i.e. interpersonal interactions around information and knowledge, which includes community mapping processes, location-based activities, dynamic processes and interactions, etc., in a geographical context<sup>3</sup>.

The traces left by smart communities are not only physical traces on the territory, but also useful information for knowing the state of the places. This aspect is of particular relevance precisely in those contexts characterized by a certain degree of danger or which have been affected by catastrophic events, in that it transforms smart communities into resilient communities, that is, in places where infrastructure, architecture and services are developed to respond to everyone's needs, especially the most vulnerable groups, and where the opportunities are equally distributed in an environmentally friendly way. In this perspective, the main elements at stake are: systems and social agents. The systems include: the natural environment, physical infrastructure, social institutions and knowledge of places. The agents are, however, the actors who shape the systems: individuals, families, private companies and civil society organizations. Hence, a complete resilience strategy is one that adopts a collaborative approach, suitable for guiding and supporting the forces of the system and social agents. And here workspaces open on the second and third elements of resilient systems: ability to self-organize and ability to learn and adapt.

<sup>&</sup>lt;sup>2</sup> RIA refers to a web programming environment that provides an intuitive user interface and access to powerful widgets and tools (e.g. Google Web Toolkit and Adobe FLEX).

<sup>&</sup>lt;sup>3</sup> Examples of this type in the field of slow tourism are MapMyHike (http://www.mapmyhike.com), a crowdsourcing platform that collects hiking routes from people (also loaded via a mobile app); PisteCiclabili, where users can upload traces of Italian cycle paths (http://www.piste-ciclabili.com); GPSaCavallo, focused on horse trails (http://www.gpsacavallo.com); Wikiloc, which offers free GPS routes and waypoints that members can upload and share and which is integrated with Google Maps and Google Earth (https://it.wikiloc.com).

In addition to being places of confrontation, smart communities are also and above all places for sharing subjective and objective knowledge (and therefore continuous learning) and become particularly important in contexts that are vulnerable or characterized by a certain degree of risk. Collaborative mapping experiences are now different in this direction in order to create shared spaces built around shared values that emerge to face problems felt as "public". They are experiments that take on different dimensions and different themes from time to time. They range from analytical, investigative, critical and claiming dimensions to propositional, monitoring, evaluative, deliberative, on the most varied themes: from the abandonment of public buildings (such as confiscated assets), to the security and safeguard of the territories.

This is how spaces are articulated in which, through dynamics of self-organization and civic hacking, issues felt as public are discussed and public goods are co-produced. The latter understood not as goods produced or owned by a public administration, but as the result of a process of social interaction. Digital technologies become tools through which social practices of collective re-appropriation and redefinition of public goods are nourished.

From this point of view there is a connection with the civic sense that mobilizes people around public problems and the practices that these mobilizations determine. People who commit themselves to the co-production of possible solutions and, often, to the implementation of the operational tools through which to define or produce them.

In this sense, the forms of slow tourism associated with forms of digital sharing, in particular those of track route sharing [3], represent the possibility of triggering a process of territorial resilience which must be the local response in the name of transformation and change in the way to approach the territories. However, this potential does not lie only in acquiring an independent recognition and identity thanks to the increase in the tracks loaded or by the followers, but rather in being able to take root in the territory, intersecting with the already existing slow paths (both trekking and biking) present in these platforms, building a capillary and dynamic network of crossing the territory capable of innervating it and developing new connections and, therefore, a new perspective of socio-economic development.

The real big challenge is represented by continuous learning that can only come from the integration between a top-down functionalist vision with a bottom-up vision, based on design processes that start from the person and the reference context (person centered in place design). It is therefore a question of enabling a strong combination of formal and informal learning. Data, information and perceptions can only be shared and can only be considered a common good.

Only once the productive fabric has been reconstituted and has corresponded to a process of territorial integration can it be said that this "formula" will have borne fruit, stimulating the economic development of the territories and the reconstitution of the social fabric. This "formula" can therefore be the way to trigger an economic development of the territory and, in turn, to encourage the reconstitution of the social fabric, as well as the rediscovery and enhancement of local resources.

### References

- 1. Ahmed, Y.A., Ahmad, M.N., Ahmada, N., Zakariaa, N.H.: Social media for knowledge-sharing: a systematic literature review. Telematics Inform. 37, 72–112 (2018)
- Aliprandi, S.: Il fenomeno open data, Indicazioni e norme per un mondo di dati aperti, Ledizioni (2014)
- 3. Balletto, G., Milesi, A., Ladu, M., Borruso, G.: Dashboard for supporting slow tourism in green infrastructures. A methodological proposal in Sardinia. Sustainability 12, 3579 (2020)
- 4. Baud, R.: The concept of sustainable development: aspects and their consequences from a socio-philosophical perspective. YES (Youth Encounter on Sustainability) Summer Course Material, ACTIS, ETH Zürich (2008)
- Chin, J., Grossman, G.M.: Intellectual property rights and north-south trade. In: Jones, R.W., Kreuger, A.O. (eds.) The Political Economy of International Trade. Basil Blackwell, Cambridge (1990)
- 6. Concas, G., De Petra, G., Gallus, G.B., Ginesu, G., Marchesi, M., Marzano, F.: Contenuti aperti, beni comuni. McGraw Hill, Milano (2009)
- 7. de Benedictis, L.: Trips, trattative commerciali, teoria economica ed evidenza empirica. In: Guerrieri, P. (ed.) Libero scambio e regole multilaterali. Il Mulino, Bologna (2003)
- 8. Deardorff, A.V.: Welfare effects of global patent protection. Economica **59**, 35–51 (1992)
- eEurope: an information society for all (2005). https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2002:0263:FIN:EN:PDF
- 10. Free Software Foundation. https://www.fsf.org/. Accessed 02 June 2020
- 11. Garrett, J.J.: Ajax. A New Approach to Web Applications (2005). http://www.adaptivepath.com/ideas/ajax-new-approach-web-applications. Accessed 29 Nov 2019
- Goodchild, M.F.: Citizens as sensors: the world of volunteered geography. GeoJournal 69(4), 211–221 (2007). https://doi.org/10.1007/s10708-007-9111-y
- 13. Hall, W., Tiropanis, T.: Web evolution and Web science. Comput. Netw. 56, 3859-3865 (2012)
- 14. Kaur, S., Misra, S.C.: Social Networking and Knowledge Sharing in Organizations. In: Encyclopedia of Information Science and Technology, Fourth edn (2018)
- 15. Le Moigne, L.: Progettazione della complessità e complessità della progettazione. In: Bocchi G., Ceruti M. (a cura di), La sfida della complessità, Feltrinelli, Milano, pp. 97–99 (1985)
- 16. Lisbon European Council. https://www.europarl.europa.eu/summits/lis1\_en.htm
- 17. Maguire, D.J.: GeoWeb 2.0 and volunteered GIS. In: Workshop on Volunteered Geographic Information, Santa Barbara (CA), pp. 104–106 (2007)
- 18. Marzano, F.: Dieci anni di Open Source nella Pubblica Amministrazione Italiana: finalmente ci siamo! In: Le soluzioni Open Source per la Pubblica Amministrazione. Le esperienze nella regione Umbria, pp. 13–16, Franco Angeli, Milano (2013)
- 19. Marzano, F.: FLOSS e Pubblica Amministrazione. In: Finalmente Libero. Software libero e standard aperti per le pubbliche amministrazioni, pp. 1–32. McGraw Hill, Milano (2008)
- Marzano, F.: Il FLOSS nella pubblica amministrazione. In: Il software libero in Italia, pp. 82– 99. ShaKe edizioni (2009)
- 21. Marzano, F.: Why we is better than me. In: "Yes WE STEM" (eBook 2016)
- Maturana, H.R., Varela, F.J.: Autopoiesi e cognizione. La realizzazione del vivente. Marsilio, Bologna (2001)
- 23. Official website of the European Union: share and reuse Interoperability solutions for public administrations, business and citizens <a href="https://joinup.ec.europa.eu/">https://joinup.ec.europa.eu/</a>
- 24. Panagariya, A.: TRIPs and the WTO: an uneasy marriage. In: Paper Presented at a Seminar at the World Trade Organization, Geneva, 20 July (1999)
- 25. Peng, Z.R., Tsou, M.H.: Internet GIS. Wiley, Hoboken (2003)

- Petrucco, C.: Partecipazione e condivisione di conoscenza negli apprendimenti on-line Participation and knowledge sharing in online learning, JO FORMAZIONE & INSEGNAMENTO. Rivista internazionale di Scienze dell'educazione e della formazione (2015)
- Piana, C.: Open source, software libero e altre libertà. Un'introduzione alle libertà digitali, Ledizioni (2018)
- 28. Plewe, B.: Web cartography in the United States. Cartogr. Geogr. Inf. Sci. **34**(2), 133–136 (2007)
- 29. Primo Braga, C.A., Fink, C., Sepulveda, C.P.: Intellectual Property rights and economic development. Discussion Paper 402, World Bank, Washington D.C. (1999)
- Primo Braga, C.A., Fink, C.: How stronger protection of intellectual property rights affects international trade flows (1999). https://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-2051
- 31. Shiva V: Protect Or Plunder? Understanding Intellectual Property Rights. Global issues (2001)
- 32. Tsou, M.T.: Revisiting web cartography in the United States: the rise of user-centered design. Cartogr. Geogr. Inf. Sci. 38, 250–257 (2013)
- 33. Turner, A.J.: Introduction to Neogeography. O' Reilly Media, Sebastopol, USA (2006)
- 34. von Bertanlaffy, L.: Teoria generale dei sistemi, Fondamenti, sviluppi, applicazioni, ILI (1968)
- 35. Wikimedia https://www.wikimedia.org/
- Yadav, P., Deshpande, S., Sengupta, R.: Animating maps: visual analytics meets GeoWeb 2.0.
   In: Griffith, Daniel A., Chun, Y., Dean, Denis J. (eds.) Advances in Geocomputation. AGIS, pp. 75–84. Springer, Cham (2017). https://doi.org/10.1007/978-3-319-22786-3\_8