

## CHAPTER 3

# Lost Networks: The *Socrate* and *Iperbole* Projects in Italy

*Infrastructure is both the thing and the story. It is the transparent and the spectacular. It is seamless in its operation and can be disastrous in its failure. It is something we do not know whether we should want and something we think we cannot live without.*

Lisa Parks (2015: 115)

### 3.1 The Web Was Not Alone

In the crucial phase of the 1990s, the World Wide Web did not emerge from an empty technological landscape. On the wave of the rhetoric of the information superhighways and the information society, international, national and local projects of networking were spreading in all parts of the globe. Nowadays, many of these projects have been forgotten because they failed or were rapidly surpassed by more efficient and comprehensive systems. On the other hand, a few examples of successful plans, such as Minitel in France, left a precious legacy in terms of cultural memory, social uses, technological infrastructures and digital literacy.

Whether remembered or forgotten, the creators of these projects did not perceive the Web as a technology of the future or as the fulfillment of the network ideology. Indeed, especially before the spread of its commercial use in the late 1990s, the Web was not so relevant to key actors such as telecommunication companies, governments or even scientists. This lack of interest also characterized the geographical area where the Web was built. Even if Tim Berners-Lee was shaping his creature in Switzerland, thus at the heart of the continent, the

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#### How to cite this book chapter:

Bory, P. 2020. *The Internet Myth: From the Internet Imaginary to Network Ideologies*. Pp. 69–115. London: University of Westminster Press. DOI: <https://doi.org/10.16997/book48.d>. License: CC-BY-NC-ND

European Union was much more interested in wiring and improving infrastructures and connectivity between member states than in finding a common system for information retrieval.<sup>1</sup> This is crucial, since the material infrastructure on which both the Internet and the Web operate were not always built *ad hoc* for these systems. On the contrary, the Internet and the Web flow through a variety of networks built by the governments and telecom companies which created these infrastructures for different purposes, standards and even for different technologies and media.

In the same period, new forms of civic participation through the Internet were taking place in different cities and regions, especially in Europe. The birth of the first Internet-based civic networks in cities like Amsterdam and Bologna entailed new organizational forms of political activism and citizenship participation. These networks built their own Internet-based systems to promote peer-to-peer communication and the involvement of citizens in local and regional policy decisions.

As this chapter aims to show, the histories of infrastructural projects and civic networks in the 1990s are essential to challenge the common idea that the Web was the network *par excellence* of this decade. In particular, these alternative and forgotten histories are relevant for many reasons. First, they show how global and local imaginaries of networks were merged and integrated, revealing some unexpected and counterintuitive nuances of the network ideology. In this regard, the European role in the construction of the Internet imaginary is usually restricted to the birth of the Web in Geneva, but the European context also contributed to the dissemination of the network ideology through laws, national reports and political visions. Current calls for a European 'intervention' on the Internet and on the data regulatory system testify that this continent and its member states are still crucial actors in the international political and economic ecosystem. This 'European hope' lies in a narrative of the European past according to which Europe is the realm of 'public service' and 'privacy policy'. However, especially starting from the 1990s, European governments and national telecom companies lost their power over the media and communication world because of their internal fragmentation and also because of the failures of national and international projects that tried to weaken the US dominance in the digital market. Overall, European histories of networking show how national and local cultures, political and economic traditions, and media landscapes impacted on the current state of digitization far beyond the Web's invention.

Finally, national and local histories of networking have also been characterized by the emergence of new political and infrastructural visions. In this sense, lost and forgotten networks are 'resilient', as they influence new techno-deterministic ideas, emerging economic and national strategies, and even new forms of political organization that keep on professing the global, European and local variations of the network ideologies of the past.

To exemplify this process, this chapter deals with two networking projects that were not conceived as Web-based systems and that took place in a

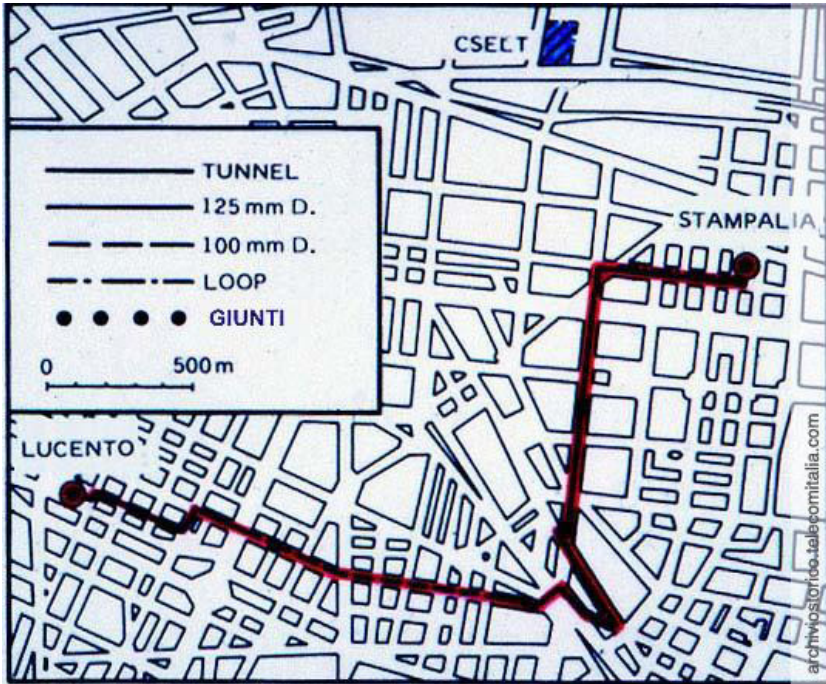
specific country: Italy. So far, Internet historians have rarely looked at the Italian technological and networked past, and this chapter aims to partially fill this historical void. But before examining the details of these two specific cases, it is necessary to briefly summarize the background of the Italian networking landscape in the 1990s, and to understand how the Italian path to digitization was characterized by previous projects and actors which contributed to the infrastructural development of its national networks.

### 3.2 The Italian Networking Landscape in the 1990s

Italy has a long and glorious past in the history of telecommunications. Well-known pioneers and inventors such as Antonio Meucci and Guglielmo Marconi have deeply influenced the global media landscape, becoming fixtures of the social imaginary beyond Italian and even European borders. Throughout the last century, the Italian national telecommunication company SIP (*Società Italiana per l'Esercizio Telefonico – Italian Society for Telephone Operation*)<sup>2</sup> had a monopoly on telephone operators in conjunction with the state company *Azienda di Stato per i Servizi Telefonici* (*State Company for Telephone Services* (ASST)). In 1994, a new national company, Telecom Italia (recently renamed TIM after a merger with Telecom Italia Mobile),<sup>3</sup> was founded in view of the imminent liberalization of the telecommunication market in Europe expected in 1998.<sup>4,5</sup> From 1933 to 1997, Telecom Italia had been part of the STET corporate group (*Società Finanziaria Telefonica S.p.A. – Telephone Companies Holding*). STET controlled eight main companies committed to telecommunication services, infrastructures, research and innovation: *Telecom Italia*, *CSELT*, *Telespazio*, *Italcable*, *Iritel*, *Italtel*, *SIRTI* and *SGS Microelettronica*.<sup>6</sup>

In the 1970s and 1980s, the STET group played an important role in the development of data networks both in terms of international standards and digital infrastructures. For example, during the 1970s, the CSELT (*Centro Studi E Laboratori Telecomunicazioni – Telecommunication Study Center and Labs*) participated with other European telecommunication companies in the creation of the X.25 standard with other telecommunication players involved in the CCITT group (*Comité Consultatif International Téléphonique et Télégraphique – International Telegraph and Telephone Consultative Committee*, now ITU-T). The X.25 was the main competitor of the TCP/IP protocol invented by Bob Kahn and Vint Cerf in the same period. STET was at the forefront of digital infrastructure development during the 1970s and the 1980s, especially in the field of fibre-optic cable infrastructure. In 1977 four Italian companies (three belonging to STET – CSELT, SIP, and SIRTI), in cooperation with Pirelli Industries, were the first in the world to connect two local switchboards by optic cables. The wire was located in Turin, the mother city of Telecom Italia, where the company was born and had rapidly grown during the twentieth century (Fig. 7).

In the early 1990s, thanks to these experimental forerunners and to an enduring success both in terms of technological innovation and market penetration,



**Figure 7:** Turin, 15 September 1977. The COS 2 optic cable path between the Stampalia and Lucento telephone switchboards of the SIP network. (Source: *Archivio Storico Telecom Italia.*)

Telecom Italia was one of the most powerful telecommunication companies in Western countries, as testified by the finances of the company. In 1994, the year in which the *Socrate* project was announced, the company was the sixth wealthiest among Western firms in terms of total revenue (26,943 billion Italian lira, around 13 billion Euros); it also enjoyed the highest annual income growth (with a rate of 8.4%) and was ranked third for technical and infrastructural investments (9,655 billion Italian lira, around 4.5 billion Euros), with more than 155,000 permanent employees.<sup>7</sup>

In addition to its healthy and stable condition, the company had a long and successful history of cooperation with other European companies such as *Deutsche Telecom*, *France Télécom* and *British Telecom*. In an age of non-competition, the organization of European monopolies facilitated and promoted cooperation among companies inasmuch as they could not compete or trespass in national markets. As the former Telecom Italia manager Roberto Parodi argues, before the liberalization of the market in the 1990s:

There was a spirit of strong collaboration between European states and companies. Then, by the end of the 1990s, with the liberalization,

competition arose with the introduction of third parties into the market. The mobile [phone] was born in a competitive environment, whereas the world of data circulation on public networks was characterized by a strong collaboration on standards. We were a leader in that context. (Roberto Parodi, personal communication, 23 September 2015)<sup>8</sup>

The cooperative approach among European players in the field of telecommunication and data networks was strongly oriented by an imaginary of the future based on the naissance of the so-called ‘information society’, a term that started spreading from the 1970s as a consequence of the global shift from manufacturing to services and from industry to a post-industrial economic organization of societies (Bell 1974). In 1978, the famous report written by Simon Nora and Alain Minc for the French government, titled *L’Informatization de la Société – (The Computerization of Society)*, stressed the importance of this historical shift from material production to immaterial services. Furthermore, the report anticipated by several years the rhetoric adopted by the US Vice-President Al Gore for the promotion of the information superhighways (Gore 1991). According to Nora and Minc, the global transition to telematics would influence the entirety of European business, politics and culture, laying the foundations of the information society:

This growing interweaving of computers and telecommunications – which we will call ‘telematics’ – opens up a radically new horizon. It is certainly not from yesterday that the means of communication have structured the communities: roads, railways, electricity are like different stages of a familiar, local, national and multinational organization. ‘Telematics’, unlike electricity, will not convey an inert current, but information, thus *power*. The telephone line or the television channels are the premises of this mutation. Nowadays, they are based on versatile transmitters, they begin to connect computers and databases and they will soon have, thanks to satellites, *an imperial tool*. Telematics will constitute not just one more network but a network of another kind able to combine images, sounds and memories: *it will transform our cultural model*.<sup>9</sup> (Nora and Minc 1978: 11–12, emphasis added)

In this excerpt the authors stress two main points: firstly, they somehow *declared* the naissance of a new and hybrid technology able to unify telephony, television and informatics, a phenomenon that would later be renamed ‘convergence’; secondly, Nora and Minc highlighted the direct link between these hybrid technologies and an emerging form of political and economic power; the innovative set of digital technologies leading to the new information society was here interpreted as *an imperial tool* able to turn the national and European discourses on technological change into strategic geopolitical leverage.<sup>10</sup> In this regard, it is worth noting that, by stressing the importance of technology

as power, the term ‘telematics’ was not just adopted to define a newly emerging communication landscape; furthermore, the term adopted a French (but also European) vision of the future, in continuity with the French tradition in telecommunications, to oppose the computer-centred ideology particular to the US imaginary, especially in its Californian identity (Flichy 2007; Turner 2006). In fact, according to Nora and Minc, the term ‘telematics’ should be conceptually opposed to the US English ‘communication’:

This neologism (*telematics*) is similar to that used in the United States: ‘communication.’ The fact that the American term focuses on informatics – computer – and ours on telecommunications is not a coincidence. It expresses a balance of forces, which, in France, favors the latter.<sup>11</sup> (Nora and Minc 1978: 13)

The semantic conflict between different ways of conceiving and interpreting the role of information technologies in this period is a linguistic demonstration of the interpretative flexibility (Pinch and Bijker 1984) of digital technologies in this period of transition.

In Italy, uncertainty about the future application of the digitalization processes is well represented by the struggle between two Italian players around the meaning of another key-term: data. Starting from the early 1980s, the ASST and Telecom Italia struggled for the management of digital packet switching networks, both claiming the right to handle and control the new data transmission systems. As the former ASST account manager Antonio Micciarelli and the former Telecom Italia manager Roberto Parodi argue:

With the arrival of the packet in 1974, we started to talk about the development of a European network. There was Euronet, which was a European packet switching network. Since we had to enter Euronet as nation states we, as *Poste e Telecomunicazioni (Mail and Telecommunications A.N.)*, created the first Italian Euronet switching centre in Via Trastevere (*in Rome A.N.*). In Italy the problem was that the ministry had kept these communication services and I was the responsible manager, so I was the protector of the data managed by the ministry. We had given the telephony license to SIP, but they said that data was telephony as well. We struggled with this issue until 1988. The ministry had the management of Telex, which was considered the beginning of data transmission in Italy.<sup>12,13</sup> (Antonio Micciarelli, focus group with Roberto Parodi, private communication, 3 November 2015)

During the 1970s, the word data meant everything and the opposite of everything. In this scenario, packet switching was created and everyone



was wondering ‘What world does this thing come from? Does it come from the world of voice? Or from the telex world instead?’ It was something completely new. There was a subtle, ongoing battle with the ministry because we, as SIP, asked to handle the network because it came from the voice and we had to do it, whereas the ministry said ‘the network was born as telex and it’s our stuff.’<sup>14</sup> (Roberto Parodi, private communication, 23 September 2015)

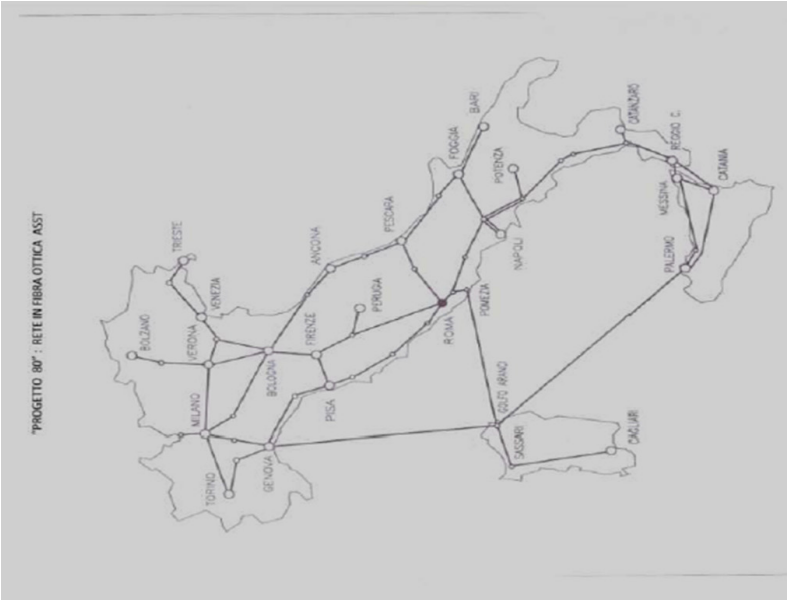
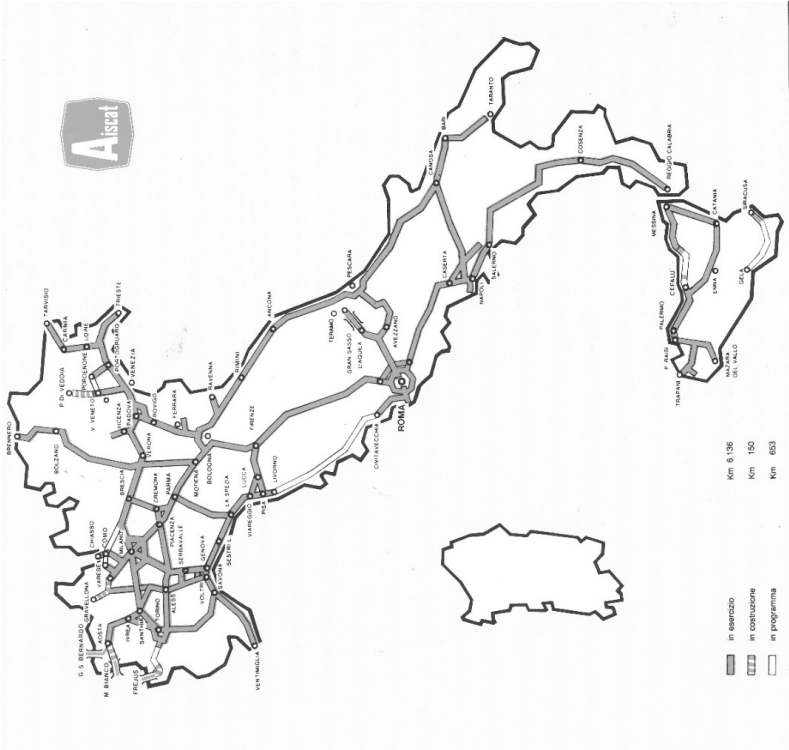
The uncertainty around the meaning of the term ‘data’ is extremely relevant; the struggle between the two telecommunications players – representing direct and indirect emanations of the government – reveals a peculiarity of the Italian approach to digital media: the dominant focus on infrastructures, and in turn on technical-managerial aspects, to the detriment of a complex and wisely thought-through emphasis on services and content.

Notwithstanding this ongoing struggle over data transmission management, Italian digital infrastructures grew rapidly in the late 1980s – and early 1990s. For example, between 1984 and 1991, ASST, STET and Pirelli built an articulated long-distance fibre-optic infrastructure with two successful and complementary projects: the first one, the ‘Progetto 80’ (Figs. 8–9), laid around 6,500 km of optic cables all along the Italian highways; the second one, the project ‘Festoni’, realized in concomitance with the Football World Championship *Italia 90*, wired the Italian west coast by means of undersea fibre-optic cables from the south to the north (see also: Bordoni 2002: 39–40). As regards the management of digital packet switching, in 1992, after many years of internal dispute, the telecommunication ministry gave charge of the network infrastructures to Telecom Italia. The decision was taken by the Ministry because it did not have sufficient human and economic resources to handle a constantly growing sector which needed more and more experts and permanent employees.

At this juncture, Telecom Italia had almost complete control of the Italian telecommunication system, data networks included, and so took the main responsibility for the national transition to digitalization. It was at this moment that the executive managers of Telecom Italia started to think about a short-distance infrastructure able to connect the long-distance fibre-optic network with households so as to spread the digitalization process all over the country and build up an advanced, competitive digital infrastructure. The *Socrate* project was conceived as the ideal way of realizing this ambition.

### 3.3 Rise and Fall of *Socrate*

The *Socrate* plan arose in view of the imminent liberalization of the telecommunications market. More specifically, it was conceived and promoted by the new CEO of STET, Ernesto Pascale, a stubborn and brilliant manager considered an enlightened man by his colleagues and even, according to the emphatic



**Figures 8–9:** ‘Progetto 80’ and the Italian superhighway network in late 1988. ‘Progetto 80’ was the long-distance optic infrastructure created by the ASST with SIRT, Pirelli and STC between 1984 and 1991. As shown in Figures 8 and 9, above, Progetto 80’s map follows the same path as the Italian superhighway system. The nodes linked by the two infrastructures highlight the importance of pre-existing networking systems, in this case transportation networks, as simplifiers and indicators of the most relevant communication hubs of the country. (Sources: Archivio Storico Telecom Italia; SpA per l’autostrada Serravalle–Milano–Ponte Chiasso 1995).



description of one of his right hand-men Vito Gamberale, 'the Enrico Mattei of telecommunications' (see Dècina 2015).<sup>15</sup> More specifically, *Socrate* was conceived to set up a fibre-optic cable infrastructure, starting with the total wiring of the 19 main Italian cities (Fig. 10), and subsequently extending to the remaining cities and the less important (from a quantitative but also economic point of view) rural areas. The key idea was to create a broadband network infrastructure capable of supporting the emerging multimedia sector and the challenges of the upcoming information society.<sup>16</sup>

Ernesto Pascale announced the project in Venice, at the annual meeting of *Réseau*.<sup>17</sup> Italian newspapers spread the news by quoting Pascale's words:

Our Telecom operating company will wire Italy, we will invest ten thousand billion lire and we will provide the country with the 'digital superhighway' it needs.<sup>18</sup> (Segantini 1995: 7)



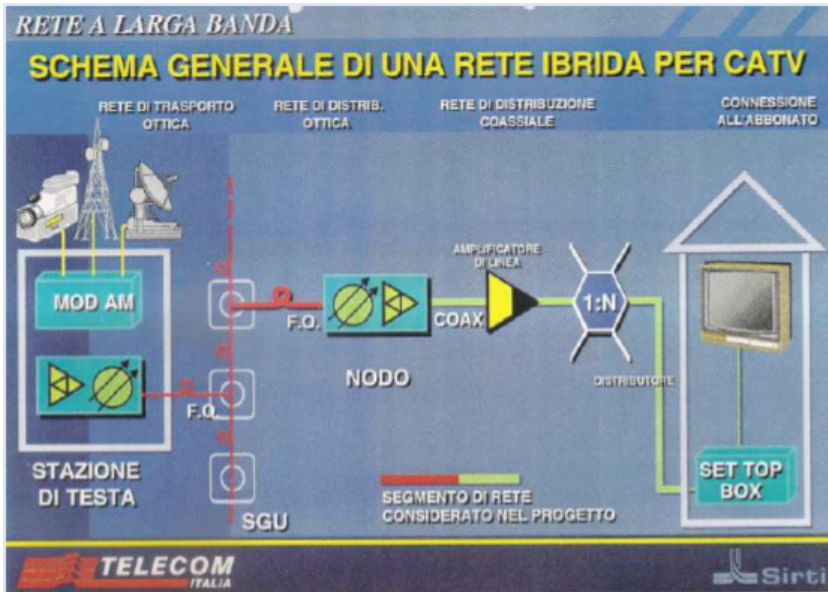
**Figure 10:** The first 19 cities wired by *Socrate*.

In Figure 10, the red markers indicate those cities in which the project moved forward quickly, whereas other key cities such as Milan (in black) rejected Telecom Italia and *Socrate* and supported other wiring companies.

With an expected investment of more than 12 thousand billion Italian Lira (around 6 billion Euros today) the *Socrate* project, along with another project named Fido-Dect,<sup>19</sup> was the most important strategic investment of the company before the privatization process, and *Socrate* is still one of the highest investments in the history of telecommunications in Italy.

It is significant that *Socrate* was developed in the context of a peculiar Italian characteristic: in this country, unlike the majority of European countries, cable television broadcasting had never existed before; as was also the case in Greece, ether-based broadcasting had had the priority in Italy since the very first transmissions. Hence Telecom Italia had to build a new digital infrastructure almost from scratch, even though it could rely on the long-distance optic fibre infrastructure that had already been constructed along the length of the Italian highways and on the Tyrrhenian coast. The *Socrate* project ended up costing only half of the total budget expected by Telecom Italia; around 2.5 billion Euros were spent between 1995 and 1997<sup>20</sup>. The major part of these funds were used to pay for the digging work and the installation of cables in urban areas.

From a technical point of view, the plan contained a peculiar feature: the final path of the network, the so-called 'last-mile' (the path connecting the network cabinets to buildings), was not made of fibre-optic cables but was wired through coaxial cables. In fact, in order to connect the short distance between the buildings and the cabinets, Telecom Italia chose to use the so-called hybrid fibre-coaxial (HFC) structure; this structure allowed a high receiving bandwidth (with a downstream power of around 1.5 Mbps) and a low upstream bandwidth (around 64 Kbps).<sup>21</sup> In this way, any form of connection could receive a huge amount of data rather than sending information through the network.<sup>22</sup> In brief, from a technical point of view, the *Socrate* network allowed only a partial and mainly unidirectional-asymmetric use of the fibre-optic capability because of its slow-upstream speed due to the coaxial cable. Hence, being restricted by this technical aspect and in order to get an immediate economic return, Telecom Italia decided to 'fill up' the infrastructure with a specific kind of content, namely video transmissions. More specifically, a new company founded by Telecom Italia itself and named STREAM was given responsibility for VOD (Video on Demand) data services, with a budget of 2 billion lira (Adnkronos 1993; Fig. 11). In an attempt to lure Italian customers to the new technology, STREAM's business strategy was initially to concentrate on covering football matches, since these are immensely popular in Italy.<sup>23</sup> Telecom Italia's strategy was thus based on a well-known technology (HFCs were already employed for cable television in the US and many other countries) and on a reliably popular content; VOD services were essential to recover a strategic investment that would have allowed the Italian company to control the new national broadband infrastructure for data transmission, even after the liberalization of the telecommunication market. Nevertheless, according to the former



**Figure 11:** General scheme of broadband network for cable TV in the 1990s. The *Socrate* network was expressly aimed at Set Top Box connection and VOD television. (Source: Archivio Storico Telecom Italia)

co-director of STET, Umberto de Julio, the decision to bet on football matches and broadcasting proved to be a double-edged choice:

Television meant two things to politics, politicians and public opinion: football and news. Nobody cared about other things, but if you touched these things, it was a serious problem, it meant touching the distribution of contents among TV networks. (Umberto De Julio, private communication, 15 September 2016)

After three years of cabling works and overspending – and coinciding with the delicate and much-criticized privatization of the company by the Prodi government (see Giacalone, 2004: 15–38) – the project was abandoned and Pascale left the company under pressure from the Italian government.<sup>24</sup> According to the Ministry of Communication, in 2002 the overall dimensions of the *Socrate* network were about 4,500 km of optic and coaxial cables, and a total of 2.5 million homes had been cabled out of the 6.5 million expected by 1998 (Fig. 12). In the long history of Telecom Italia – but we could say in Italian history generally – infrastructures and investments had usually favoured the north of the country, thus contributing to the so-called *Questione Meridionale*, namely

REGIONE / CITTA'	U.I.
PIEMONTE	526.000
di cui TORINO	377.000
VALLE D'AOSTA	20.000
LOMBARDIA	1.237.600
di cui MILANO	776.100
TRENTINO ALTO ADIGE	110.500
FRIULI VENEZIA GIULIA	168.800
VENETO	481.400
EMILIA ROMAGNA	562.100
di cui BOLOGNA	237.100
MARCHE	70.000
LIGURIA	343.000
di cui GENOVA	270.000
TOSCANA	499.200
di cui FIRENZE	221.200
UMBRIA	70.000
LAZIO	1.051.700
di cui ROMA	951.700
ABRUZZI	73.000
MOLISE	15.000
SARDEGNA	90.000
CAMPANIA	461.300
di cui NAPOLI	329.300
BASILICATA	18.000
PUGLIA	261.700
di cui BARI	148.700
CALABRIA	63.000
SICILIA	446.100
di cui PALERMO	191.500
<b>TOTALE U.I.</b>	<b>6.569.400</b>

SIRTI S.p.A T-RT 01/10/96

**Figure 12:** The number of Housing Units (U.I.) to be wired by the end of 1998, according to Telecom Italia. Eventually, the project succeeded more in Southern Italy, in cities such as Naples and Bari. (Source: Telecom Italia).

the gap in terms of infrastructures, employment, and services between Northern and Southern Italy. The case of *Socrate* was nevertheless unique in this sense for two main reasons. Firstly, the south was more open to the cabling. The mayors of cities such as Naples and Bari facilitated the digging phase as the project was seen as a technological advance for these cities. Secondly, Telecom Italia's strategy was oriented towards the promotion and valorization of local competences and infrastructures in Southern Italy. Besides the *Socrate* project, Telecom Italia created a start-up centre in Naples (the city that best represents the problems of the southern regions), and also organized important conferences and public events about technological change throughout the 1990s. Eventually, when *Socrate* stopped, southern cities, more than northern ones, found themselves wired with an almost useless infrastructure. Considered to be one of the major failures of Italian telecommunications history, *Socrate* stopped halfway, during one of the most critical periods of the so-called Internet revolution.

### 3.3.1 *The Uncertain Reasons for the Failure*

Two decades after the official end of the *Socrate* project, the reasons for its failure are still uncertain and ambiguous. In its corporate communication Telecom Italia usually avoids naming the project, even in the historical accounts of its long lifespan. Except for in some more recent accounts,<sup>25</sup> the name *Socrate* is absent from the company's corporate communication in the 2000s; this is probably due to the subtle intention of the company to throw into oblivion a wound that could have damaged its public image.<sup>26</sup>

Generally speaking, the accounts of those people who worked or still work for Telecom Italia, the accounts of national newspapers and the analyses of academics and opinion leaders, seem to diverge on many points. Notwithstanding the heterogeneity of these critical stances, it is nevertheless possible to summarize the main explanations of the failure through three broad, even if non-exhaustive, categories: firstly, that it was caused by failing to deal with the materiality of the network; secondly, a purely technological explanation; finally, a cause related to market competition and to the organization of the Italian media landscape.

From a material point of view, the expense of the excavation in the Italian cities was unexpectedly high, especially because of the political (in some cases even ideological) resistance of municipal administrations in some strategic areas such as Milan and Bologna, where the future competitors of Telecom Italia and the administrations baulked at leaving the infrastructure in the hands of the monopolist. Moreover, all the key informants interviewed for this work agree on one major material obstacle for *Socrate*:

To send cables to houses, we had to dig, and *Socrate* was mainly doing this: digging. The municipalities gave us the permits but asked in return for expensive street renovation works, which caused huge expense. (Maurizio Dècina, private communication, 9 November 2015)<sup>27</sup>

It was basically digging. There were places like Naples where we found the strangest things underground and where the documentation often did not match reality. There were also improper acts by other companies that destroyed the pipelines we had made before. (Alberto de Petris, private communication, 8 February 2017)<sup>28</sup>

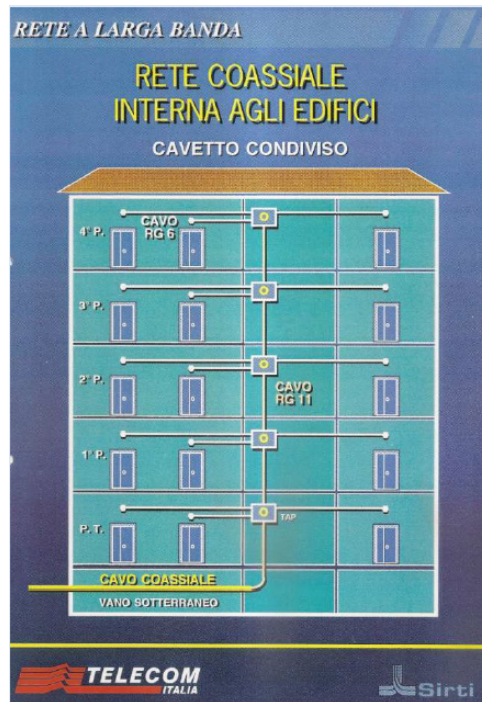
From an economic point of view, making the network itself was not very costly. What was very expensive was digging! 80% of the requests made to the ministry were to convince municipalities to dig. Digging didn't only involve creating the holes: it meant digging trenches 70 cm deep and putting down the breccia and sand that the cables would rest on. In some places you even had to put protective multi-pipes on the cables! [...] It's a lot of money! (Antonio Micciarelli, private communication, 3 September 2015)<sup>29</sup>

These quotes emphasize the key moment in which the materiality of a network is publicly visible: the digging. Whereas phenomena such as the installation of trans-oceanic cables are almost invisible, the visibility and disruption of urban digging not only changes the perception of the cabling process but also potentially exposes it to the interventions of political and economic players such as municipalities, households, public and private companies. In this regard, digging in urban areas has a double-edged effect. On the one hand, it is a public manifestation of something that is changing, of a 'work in progress' that may improve services and everyday life. On the other hand, digging also means disturbing social life and social habits, for instance by rerouting public transport, obstructing access to stores and buildings, or temporary cutting off essential services such as electricity and water distribution. In this regard, the digging process offers special leverage to municipalities, which can ask for 'expansive renovations' and extra works for the city in return for official permits. Furthermore, the digging phase points out another issue: the infrastructural adaptability of networks. Networks must adapt to each other, since new infrastructures should not disturb the old ones such as energy cables and water pipes. The *Socrate* infrastructure was planned on the basis of the copper cable maps of Telecom Italia; however, as the network account manager Alberto De Petris points out, other infrastructures stood in its way. Copper pipes, fibre-optic cables, water pipes and energy wires and cables (what we could call the public service networked infrastructure) all have to adjust to each other in



order to avoid mutually disruptive forms of ‘noise’ or technical disturbance. Overall, the above quotations stress the importance of materiality, but not only in terms of infrastructure or ‘physical presence’; materiality is here also a matter of other material and immaterial resources such as time, money, energy and workforce. Even though not all these nuances of the material dimension of networks are consistently present in the social imaginary, they are deeply rooted in the experiences of telecommunication experts and managers, since they had a great influence on many of the critical decisions taken, for instance, by Telecom Italia’s executive board (e.g., the choice of the coaxial cable was also due to its physical flexibility and, not less important, its lower cost that allowed easier and cheaper installation in the buildings when compared to the fragility of fibre-optic cables) (Fig. 13).

The second reason for the failure of *Socrate* is more technological and mainly related to the rapid development of alternative and innovative techniques for data transmission. Starting from 1997, the development of the Asymmetric Digital Subscriber Line (ADSL) allowed a bandwidth much more powerful



**Figure 13:** The coaxial network within buildings in 1995. The elasticity of coaxial cable allowed a simple distribution of connectivity inside buildings. (Source: Archivio Storico Telecom Italia).

than *Socrate's* hybrid structure.<sup>30</sup> Moreover, the ADSL relied on the existing copper cables, thus it made the technology adopted for the *Socrate* infrastructure suddenly inconvenient both at the economic and technical level. Hence, the ADSL soon became the ideal technology for data transmission as well as for the spread of Internet services to generic users. This technology is still widely used in Italy, and it has sped up the spread of the Internet in Europe generally.<sup>31</sup>

Finally, the failure of *Socrate* can be attributed to the lack of *ad hoc* content and to the unsuccessful investments made by Telecom Italia in the broadcasting media market. Indeed, the new digital broadcasting company 'STREAM' was created to get an immediate economic return in order to recover the huge costs of the *Socrate* infrastructure. Nevertheless, two problems stood in the way: Firstly, the main Italian national broadcasters, especially the public service group of RAI (*Radio Televisione Italiana*) and Silvio Berlusconi's private company *Fininvest*, were not interested in switching their show schedules to cable TV, since both the ether and the satellite methods were still more convenient; the ether in particular was well-rooted in social habits, and the advantages of VOD services were insufficient to convince the audience to change technology.

Thus Telecom Italia's dream of a new digital cable network that would also include other broadcasters faded away. Furthermore, the revenue generated by STREAM subscribers did not cover even a small part of the general investment made by Telecom Italia in *Socrate*.

A few years later, in its own historical account, Telecom Italia itself would admit that in that period:

There was everything but probably what was missing was the market [...]. The technology and the market did not meet each other, because the digital television offer continues to increase thanks to satellites and DVDs, which are available almost in every single block at vending machines or specialized stores. [...] Moreover, to make matters worse, beside this growing amount of contents and supply points, in late 1990s, the Internet came to mix everything up.<sup>32</sup> (Telecom Italia Lab 2004: 149)

*Socrate's* failure in the media market was due to the weak attraction of Italian customers and users to broadband-based services in general. In this regard, the Telecom engineer Ivano Camerano<sup>33</sup> argues:

When looking back at the mid-1990s, we now understand that it was too early. First, because technology was not mature enough to provide an infrastructure that could really be useful, beyond any project or dream, to provide a value in terms of broadband connections. Above all, however, the main problem was that we, as Italians and Europeans, were not ready for broadband services at all. Someone claimed, 'We will

get thousands of information and VOD services,' but in the end the bottom line was that we were not used to it, we lacked the mentality for this approach. In the US, it was completely different.<sup>34</sup> (Ivano Camerano, private communication, 15 October 2015)

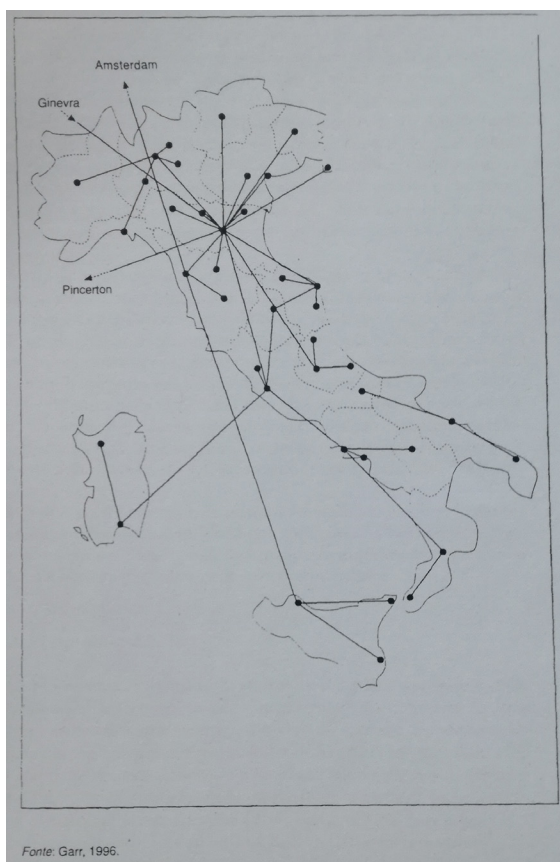
The expression 'lack of mentality' summarizes a crucial aspect of the network imaginary characteristic of Telecom Italia and, we can argue, of the overall Italian context during the mid-1990s: the expected use, the future, and thus the *meaning* and *functions* of both computer and digital networks were not clearly understood and anticipated by the different strata of the population, nor by media and business actors. The uncertainty of the 'information age' was in this sense self-evident, as it is a matter of fact that the Internet and the Web, between 1994 and 1997 were not seen by Telecom Italia as the future of communication technologies but only as one of the possible emergent services within the global media landscape. In the meantime, the Internet and the Web were spreading in the US and in other European countries. Nevertheless, while Telecom Italia was investing its energy in *Socrate*, some Italian academic and political players were already paying attention to the growth and the potential of the Internet'

### 3.4 The *Other* Network: The Internet in Italy

During the 1980s Italy was at the forefront in Europe in terms of Internet connections. Indeed, Italian universities were among the first to get an Internet connection, by linking Italian research centres to the US and to North European countries. On 30 April 1986, Italy became the third country in Europe to be connected to 'the net', after Norway and England.<sup>35</sup> The first Italian Internet connection took place thanks to special funding provided by the US Department of Defense to the research group guided by Luciano Lenzini, professor of engineering at the institute *CNUCE – Centro Nazionale Universitario di Calcolo Elettronico* (*National University Computing Centre*), based in Pisa. During the same period, the interconnection of the Italian university network, named GARR (*Gruppo per l'Armonizzazione delle Reti della Ricerca – Research Networks Harmonization Group*), was taking place by exploiting the power of some key hubs such as the supercomputing centre CINECA in Bologna. Thanks to cooperation among academic, economic and political institutions, the network developed rapidly, and in 1991 a new national infrastructure connected seven Italian universities;<sup>36</sup> a few years later, in 1996, 38 research centres were connected to the Internet, creating a large and well-developed research infrastructure for data transmission (Fig. 14).

Despite the key role played by Italy in the spread of the Internet network in Europe, a proper 'Italian history' of the Internet has been introduced to the public only in recent times. Notably, the anniversary of '30 years of the Internet in Italy' has recently been celebrated by scholars (e.g., Abba and Di Corinto

2017), newspapers (e.g. Cella 2016) and even companies (e.g., Fastweb 2016, Telecom Italia 2016) in conjunction with the political plan *Agenda Digitale per l'Italia* (Italian Digital Agenda) promoted by the Italian government and especially by the Italian Prime Minister Matteo Renzi in 2016. More specifically, the digital agenda is aimed at re-positioning Italy at the top of the European ranking for ultra-fast broadband connections, so as to again play, in the near future, a strategic role in the European digitalization process.<sup>37</sup> Curiously, during the 1990s, far from being interested in promoting these successful events, Italian companies, mass media and institutional actors tended to glorify the diffusion of other technologies, focusing, for example, on the outstanding growth of mobile telephony: the success of an innovation which was in line with the



**Figure 14:** The GARR network in Italy in 1996.

The map highlights the importance of the CINECA supercomputing centre in Bologna. This centre was the main hub of the network, as it was connected both to Princeton University in the US and to CERN in Geneva. (Source: Report Censis 1997: 379).

Italian traditional expertise in telephony, to some extent put the emergence of newer technologies such as the Internet in the background.

Notwithstanding this gap in the public narrative, Italy was conducting a series of fruitful and pioneering experiments on the potential of the Internet. Such experiments concerned market strategies, public policies and more traditional media such as the press. In 1994, the Sardinian editor Nicola Grauso launched the official website of *L'Unione Sarda*, the first newspaper to go online in Europe, and the second worldwide. In the same year, Grauso also founded the first big Italian Internet provider, named *Video On Line* (VOL); VOL did not just provide Internet access to Italian citizens, but was also an example of how media could support digital literacy by means of user-friendly tools such as floppy disks and instruction manuals; these objects were distributed for free with national newspapers and comics.<sup>38</sup> The importance of VOL was later acknowledged by Telecom Italia. In 1997, when the failure of *Socrate* was almost certain, the (at this point ex-) monopolist bought VOL and founded its new Internet Service Provider (ISP) named *Tin.it*. Furthermore, in the same year the Italian entrepreneur Renato Soru founded Tiscali, the first ISP giving flat-rate Internet access to Italian customers. Italy was starting to adjust to the Internet model, even if it was still waiting for the necessary infrastructure to exploit this technology on a large scale.

### 3.4.1 *Iperbole: The Pioneering Italian Civic Network Project*

During the digitalization process, one of the most interesting experiments in Italian Internet use was taking place in Bologna where, in 1993, the council member Stefano Bonaga and the philosopher of language Maurizio Matteuzzi created IPerBOLE,<sup>39</sup> the second civic network in Europe and the first in the world providing free Internet access to citizens. The first civic network in Europe was the *Digital Stadt* of Amsterdam, which had been founded a year earlier (see: Alberts et al. 2017; Downey and McGuigan 1999). It is important to note that the *Iperbole* project took place before the commercialization and the consequent spread of the World Wide Web. Thanks to cooperation among public and academic actors,<sup>40</sup> *Iperbole* achieved outstanding success, receiving the attention of international organizations and institutions.<sup>41</sup> In 1996 more than the 15% of the citizens of Bologna had personal Internet access and an email account. Thanks to a free platform they could access the Internet from public computers, discuss with other citizens on forum groups, and communicate with administrative and municipal offices (e.g., ask for information on traffic, health, justice and municipal law issues, see Fig. 15). The list of services included:

- Access to newsgroups (from 1997 'full Internet' access) from public kiosks
- Free Internet subscription for non-profit local organizations and trade unions, plus low-rate personal Internet subscriptions for citizens

- Personal email accounts and communication with municipal services (e.g., asking for information about public services, municipal laws, police stations etc.).
- Discussion groups created by the municipality
- Direct and remote training for 'absolute beginners'
- E-commerce and barter groups
- Users' guides to the platform

Before the launch of *Iperbole*, the municipality trained the staff, even if, according to Damian Tambini (1998: 86–87), the local government had not imagined how difficult it would be to provide digital literacy to the administration. Indeed, the early users of *Iperbole* were mostly young male students and managers, thus already digital literates.

Discussion groups were mainly set up by the municipality itself, but citizens could create their own groups. As the history of ARPANet teaches us, leisure and hobbies can prevail over serious issues. The titles chosen by citizens for discussion groups confirm this tendency: *Bologna by night*, *cooking*, *swap shop*, *sport and jokes exchange*. However, other groups such as *Politics*, *work*, *Metropolis*, *university* and *health* were among the most accessed on the network (Tam-



**Figure 15:** The navigable map of the civic network platform *Iperbole* in 1997. The figures of each building corresponded to a specific service; the interface was aimed at overcoming linguistic diversities so as to include tourists and migrant citizens. (Source: Maurizio Matteuzzi private archive).



bini 1998: 96–97). In 1997, 200 local organizations promoted their Web pages on the platform, involving citizens in online polls and in collective discussion mediated by the municipality. Nevertheless, the municipality could not handle the growing number of messages, thus slowing down the activist spirit of the network.

The first release of the *Iperbole* project is extremely relevant for the analysis of the network imaginary that characterized a relevant community in Italy. *Iperbole*, in fact, was not only conceived as a public service; it was rather a political project aimed at exploiting the Internet for the proactive and voluntary participation of citizenship. As the founders Stefano Bonaga and Sergio Matteuzzi argued in the first release of the project, dated 1993:

It must be assumed as a starting point that technology now makes possible a wide range of direct and real democracy applications: direct as it is done in person without the mediation of delegation; real, as its interactive and bidirectional, and not one-to-one. The project not only finds in the Municipality of Bologna a subject interested in technology but also a favorable and natural context for its realization: *the city is, at this stage, the strategic subject indispensable in fostering the takeoff of computer democracy*. In this political context, characterized by the ever-increasing incidence of television power, with the filtering and simplifying of languages on how to conform to democracy, it is of paramount importance that local authorities are aware of the importance of disseminating information and of the widest scope of public debate to become pioneers of democratic bottom-up experiments.<sup>42</sup> (Comune di Bologna 1993: 6 emphasis added)

The idea of a city that plays the role of an intermediary, we could say a *medium*, through which electronic democracy could take place, was particularly innovative and extremely powerful at the time, both in terms of political agency and the construction of a network imaginary. In a later paragraph titled *The democratic city as bottom-up innovation*, the idea of a horizontal citizenship able to share, construct and decide on public issues is stressed in depth:

The innovation of this project is therefore linked primarily to the active, conscious, and strategic role of the public administration in stimulating computer democracy and administrative transparency and in orientating *the future use of cable communications towards low cost collective participation rather than towards a further articulation of the entertainment and information-entertainment business*. Another innovative aspect, of great political value, is that of users' digital literacy. [...] Being in a democratic local network means not only providing machines and software, but above all spreading literacy, educating, writing, responding, reading, spreading information properly, and searching for it

effectively. To create a user who is actively conversing in a civil way, who knows how to argue with and search for the right interlocutors. In sum it is all about creating *a form of interactive communication opposed to the television paradigm* in which the citizen is conceived as a passive spectator of phenomena in which he is not stimulated to participate. Only a local democratic institution such as an elected administration and the citizens themselves may have the political will and the concrete capacity to break an obsolete model and develop a real electronic democracy.<sup>43</sup> (Comune di Bologna 1993: 7 emphasis added)

From a theoretical, but also clearly ideological perspective, *Iperbole* was in contrast with the imaginary lying behind *Socrate*. Bonaga pursued a long battle against the centralization of information promoted by Telecom Italia, since the Italian monopolist was following the broadcasting model of television 'in which the citizen is conceived as a passive spectator of phenomena to which he is not stimulated to participate'.

Quite differently, the core idea of the civic network was to use the Internet as an instrument to realize a political transition from representative democracy to direct democracy; from delegation to first-person action, hence from verticality to horizontality.

This vision went far beyond the recurrent idea that cities, and in turn citizens, can become more 'smart' by applying smart technologies to urban life (Mosco 2019). Although the Internet was the chosen instrument for the actual realization of this process, technology was not seen as the primary cause of social change. The Internet was not the 'reference model' for change as it was to the imaginary promoted by Berners-Lee and by the dominant narrative of Internet history in general. The Internet was rather seen as a tool for the realization of a political and cultural process that, especially within cultural and political cities like Bologna, had been at the centre of public debates for a long time. Indeed, throughout history, and starting decades before the birth of the Web, Bologna had played a key role in the construction of an alternative – usually left-oriented – political movement. Starting from the 1960s, local communities had tended to make use of and incorporate mass and telecommunication media such as radio, press and telephony into political processes.<sup>44</sup>

In this regard, a key example is the countercultural experimentation of the 1970s when the pirate and free radio movements emerged in Italy. In 1976–1977 *Radio Alice*, a pirate and 'illegal' experiment of communitarian political participation, gained great attention in Bologna and also aroused the interest of influential intellectuals and opinion leaders such as the French philosopher Félix Guattari (Goddard 2011). Not by chance, at around this time Guattari, with another French philosopher, Gilles Deleuze, redefined the concept of the rhizome (Deleuze and Guattari 1977), providing a theoretical model to contest the dominance of centralized capitalistic power.<sup>45</sup> A key figure of the leftist Italian

landscape, the Italian philosopher Franco ‘Bifo’ Berardi, was among the founders of the *Radio Alice* project. When recalling *Radio Alice*, Berardi stresses the fact that the rhizomatic network, a theoretical form similar to the distributed network model, was already circulating among Italian activists:

In 1977, Deleuze and Guattari published this booklet, *Rhizome*, which was to us like Mao’s red book. They said that the history of Western capitalism is based on the tree and the hierarchical order, but that it was possible to discover a model of social life based on the rhizome, a totally a-centric system in which each point is the centre of the world. The concept of rhizome appeared to us as the utopian model of the society we had to build, and it was what we were actually doing with the free radios! We said ‘we are on the right track!’ [...] I came from the experience of the free radio where we had already experienced this issue in Italy, especially with Radio Alice; we always insisted that the radio is a centralizing medium but, with the phone, it can become an a-centric medium. Nowadays, I have understood that we misinterpreted what we saw as the ‘sun of the future’ that was instead the new stage of the history of capitalism. The rhizomatic form is the form that neo-liberalism has incorporated and the connection between the Internet and the large corporations of imaginary production is now completely realized on a productive level.<sup>46</sup> (Franco Berardi, private communication, 19 October 2015)

According to Berardi, the combination of radio and telephony had already been seen as a possible solution for the realization of the distributed model of communication particular to both the Internet and the Web imaginaries. Nevertheless, the main difference between these imaginaries and those of projects such as *Iperbole* and *Radio Alice* lies in the role, the agency, of technology in this process: whereas the Internet imaginary has historically paid more attention to the *effects* of technological structures and infrastructures on the organization and progress of societies, the imaginaries of these alternative projects were deeply rooted in political and cultural programmes that conceived technology as an *instrument* rather than as a *cause* of social, cultural and political change. This theoretical distance, this gap, also determined in part the failure of *Socrate*. At the same time, vertical power structures and the lack of cooperation among institutional and private actors led to the end of *Iperbole*, at least as it had been conceived by its founding fathers. The resignation of Bonaga from his leading role because of the conflict with Telecom Italia, the lack of competence and of human but also economic resources in the local government, and the progressive loss of users (who migrated to other ISPs, platforms and especially other websites) caused the end of the interactive and participative dimension of the civic network.

### 3.5 Conflicting Imaginaries: *Socrate* vs. *Iperbole*

*Socrate* and *Iperbole* represent two contrasting visions of the meaning and the role of networking systems for society. This conceptual distance reflects the different networks of relations and, no less important, the different scale of power in Italy during the mid-1990s. The two models, the vertical infrastructure of *Socrate* and the peer-to-peer network imagined by *Iperbole*, show how technologies can be best understood ‘as a focus of social struggle, and not as a predetermined ‘given’ that creates just one technologically determined future’ (Bauwens et al. 2019: 3).

Given this profound divergence in views, it is not surprising that the Bolognese administration and Telecom Italia came into conflict in this period, as shown in an article in the tech-magazine *Internet World* (Fig. 16).<sup>47</sup> According to the assessor Stefano Bonaga, *Socrate* represented an opposite and negative vision of the information society; it was a centralizing and unequal infrastructure based on vertical and proprietary control:

I stopped *Socrate* in Bologna. I stopped it for years because it was a folly. Bologna was strategic for them because of its geographical position and for the whole topology of the network. You are striking a chord because nobody recalls it but it was a crazy battle. Pascale came by private jet and stepped into my little office to ask to pass the network through Bologna. He came every three days! We did not give him the permit to dig. We proposed an alternative project, *Optubi*, which was the opposite of *Socrate*. The idea was to use sewers and electricity pipes to cut the costs. It was above all for economic democracy, because they could put more cables which would be good for competitors as well, and the municipality could keep control over the territory. The municipality would also earn a lot of money because it provided more than a half of the excavation value. Instead, today we give for free to three private companies the territory for ultra-broadband cables, and the municipality just plays the role of ‘facilitator’. The municipality has no political and social control of any kind. I am very fond of this. *Iperbole* is an acronym which stands for *Internet ‘For’ Bologna and Emilia Romagna*. *Socrate*, on the contrary, reiterated a crime that has been going on for decades in the Italian economy. We have lagged behind for decades because of that failed project that built the same highways of Southern Italy: empty highways.<sup>48</sup> (Stefano Bonaga, private communication, 21 October 2015, emphasis added)

This quote contains two interesting elements. First, it explicates the main matter of conflict between Telecom Italia and *Iperbole*: the control of infrastructure at the private vs. local, political level. Secondly, at the imaginary level, Bonaga subverts the positive meaning of the famous information superhighways



**Figure 16:** 'Internet and centralism are an oxymoron'.

A 1996 article published in the Italian journal *Internet World* opposing Telecom Italia and *Iperbole*. (Source: Maurizio Matteuzzi private archive).

metaphor, a concept largely adopted in the corporate communication of Telecom Italia but also in academic and technical documentation (e.g., Chirichigno 1995; Richeri 1995). In this excerpt, Bonaga compares *Socrate* to one of the worst failures in Italian history, both in terms of road infrastructure and political propaganda. The Salerno-Reggio Calabria highway, which was conceived to connect Southern and Northern Italy, and was thus to be a symbol of the renaissance of the south, has instead become the symbol of the slowness and the congenital backwardness of Southern Italy. Similarly, even though within a less ideological and more pragmatic framework, the *Iperbole* co-founder Maurizio Matteuzzi criticized Telecom Italia's strategy:

We have never toed the Telecom line. They launched the *Socrate* plan; they did a lot of stuff. They laid the fibre-optic cables but this eventually made the fortune of Fastweb, which bought the cables. [...] Cabling

was too much important at the time for them; the big mistake, from my point of view, was from a network policy perspective. First they should have thought about services, and only afterwards about cabling.<sup>49</sup> (Maurizio Matteuzzi, private communication, November 2, 2015)

This idea, that *Socrate* was wiring ‘empty cables’, is also shared by the media scholar Giuseppe Richeri, who worked as research consultant for Telecom Italia during that period:

The *Socrate* project was guilty of technological determinism. In those years convergence was an ambiguous concept. *Socrate* was mainly based on technology, with the idea that everything can be transmitted using the same infrastructure. There was actually a technical convergence, but few paid attention to the convergence of content services. The main concern was for the container. There was little reasoning about the contents.<sup>50</sup> (Giuseppe Richeri, private communication, October 2, 2015)

However, the deterministic idea based on the motto ‘If you build it they will come’ (Kozak 2015), thus on a ‘natural’ and self-fulfilling development of contents and services as direct consequences of the infrastructure’s construction, was not a unique trait of Telecom Italia. Notably, the Italian company shared this deterministic vision with other national and international players who were promoting the construction of national infrastructures without providing a reliable guideline for the creation and development of contents.

As the media historian Stephanie Ricker Schulte has claimed, the mental representations of networks were not univocal ‘but instead overlapped, contradicted, competed, and dovetailed with one another, sometimes simultaneously’ (Schulte 2013: 1). During the 1990s, the European Union was pushing national states to build and connect digital infrastructures able to bear the liberalization of the market; there was a sort of *urgency for infrastructures* to survive the competition and the growing dominance of the US in the new digital marketplace, even if the nucleus of this market was not clear at all. On the very same wavelength, Italian politicians tended to stress this urgency for connectivity, even adopting some suggestive metaphors and analogies from national industrial history:

The multimedia revolution will not happen spontaneously. There is a need for short-term availability of broadband telecommunications infrastructures, which means achieving simultaneous broadcasting of voice, data and video services, all spread over the territory and accessible at low cost. This infrastructure (which can perform the same



functions as the railway network during the first industrial revolution and which will represent the distinctive feature of developed countries) is essentially based on the wiring of the territory with fibre-optic cables.<sup>51</sup> (Bosco 1995: 5)

Drawing upon the railway metaphor (rather than on the more common highway one)<sup>52</sup>, the Italian government highlighted the importance of fibre-optic infrastructures for the development of the ambiguous 'multimedia market'. Similarly, the CEO of STET, Ernesto Pascale, was certain of the importance of cabling as a key step for the future of the global society:

Cabling is the technological evolution of telecommunications; we would do it for the phone even without the interactive multimedia market. We are anticipating investments that will stimulate the supply of services over time. [...] I have confidence in the multimedia market, I am sure that we are at the beginning of an era that will change our way of working. I feel 'in my flesh' that this is going to happen; this means greater investment, new subjects and more jobs.<sup>53</sup> (Pascale, audio recording, 1995b)

In addition to this sort of premonition about an irreversible process – 'I feel in my flesh that this is going to happen' – Pascale seemed also to blindly trust that interactive television would be the chosen medium for this epochal transition to the digital age:

A new revolution is about to start. It will be the interactive multimedia television in 1997; that will be the real revolution. Today we are in a preliminary phase. [...] There will be a chain of exchange, the so-called information society, especially in entertainment. A new TV will be added to the general TV with which it will compete. Tele-market and distribution chains will change. This also applies to banks, tour operators and education. An additional, supplementary, and in part substitute world is approaching, and it offers tremendous opportunities.<sup>54</sup> (Pascale, audio recording, 1995a)

The former STET general co-director Umberto De Julio, when asked about his biographical story as Telecom Italia executive manager, recounts the birth of *Socrate* through the following anecdote:

Pascale was so determined. [...] I have in mind an episode. We went together to London to talk with Chinese managers about an offer in China. When we went out of the hotel in London we saw a group of workers who were laying cables for an American company. Pascale

said, 'Do you see it? They will come soon in our homes! Before they do it, we have to do it.' So, *Socrate* happened. 10 thousand billions, to get into 10 million homes. (Umberto De Julio, private communication, 15 September 2016)

According to De Julio, to protect the role of Telecom Italia meant, to Ernesto Pascale, to defend Italy from the US invasion in the digital and telecommunications market. Again, the focus of this kind of discourse was always on the importance of the infrastructure, rather than 'the other market' that the US would soon control: the Internet. When asked about the role of the Internet in that period, De Julio replied:

It was like the Internet did not exist. I remember when Maurizio Dècina came with Vittorio Trecordi into my office and said: 'I want to show you the Internet'. Trecordi arranged an Internet connection and I remember I felt a mixture of anguish and something else. It was like I was abandoned in the sea. It was like seeing a new dimension was coming up, a dimension that was absolutely unknown at the time. So we knew how to play in the market but there was no such thing as an 'Internet offer' strategy [...]. We were trying to understand; I became consultant for Vint Cerf. I used to visit him every 4–5 months in the US, and then he came to Italy to teach internal seminars because we wanted to get into this world. However, we had just launched *Socrate* and we were in the middle of the outstanding success of the mobile... We had two great paths ahead: the first was the broadband network, and the other was the mobile phone.<sup>55</sup> (Umberto De Julio, private communication, 15 September 2016)

This excerpt contains two relevant points related to both the media and network imaginaries of Telecom Italia during the 1990s. Firstly, De Julio perfectly conveys the feeling of the sublime when he describes the effects his first Internet navigation had on him; it is hard to find a better representation of the sublime in its original Romantic meaning than 'a mixture of anguish and something else. It was like I was abandoned in the sea'. Secondly, however, De Julio subliminally discloses the fact that the Internet was largely overlooked by Telecom Italia, primarily because of the main focus on broadband infrastructures and mobile telephony, but also because of the high risk that an additional investment in a new and unknown technology would have entailed for the future of the company. The differences between Italian and US companies in the reasons for their attraction to the Internet seem to lie in two different market strategies, but also in the different *generations* who played a key role in this sector during the 1990s. Whilst in Italy both technological development and market strategies were dictated by a traditional and vertical structure represented by the managers

of the telecommunication monopoly and its experienced employees, in the US, the growth of Internet-based companies relied on start-up investments and on young project managers who bet on digital innovation. Making a slightly forced analogy with US history, Italy did not bet on Silicon Valley, it bet on AT&T.

### 3.6 The Ruins of *Socrate*

In 2005, in his commemorative speech for Ernesto Pascale, who had died a few years after his resignation from STET, the former CEO of Telecom Italia Mobile (TIM), Vito Gamberale claimed:

Ernesto conceived the *Socrate* project, the fibre-optic cabling of the country, in order to provide advanced services and advanced access to the whole country. He proceeded with the courage of the pioneer and with the serenity of reason. In that period the project was firstly criticized and then blocked. Today the country needs it, yet does not have it.<sup>56</sup> (Gamberale 2005)

Gamberale's critical stance against the voluntary interruption of *Socrate* by Telecom Italia should not be seen just as a consideration *post factum*; at the time European countries had a very positive impression of the *Socrate* project. In the mid-1990s, *Socrate* was seen at the national but also at European level as the project that would allow Italy to occupy a leading position in the field of digital infrastructure. Compared to other countries, *Socrate*'s fibre-optic network would be at the forefront, and Italy would have had an advanced broadband infrastructure able to provide a competitive advantage in the digital market and in the digital literacy process. As the journalist Adele Hars wrote in the specialist fibre-optic magazine *Lightwave* in April 1996:

If the Socrate Project proves successful, Italy could become Europe's leader in fiber-optic networks. (Hars 1996)

*Socrate* would not only have granted an immediate advantage to Telecom Italia, but it was also important from a long term perspective; even if the hybrid FHC solution was soon to become obsolete, the coaxial cables could have been replaced by fibre-optic cables, as was actually done in the early 2000s by the new owner of part of *Socrate*'s infrastructure, Fastweb (Maldoom et al. 2005: 179).<sup>57</sup>

Although the material traces of *Socrate* can be considered as enduring resources for the future of the Italian communication system, Italian citizens tend to associate the memory of *Socrate* with the ruins represented by the old

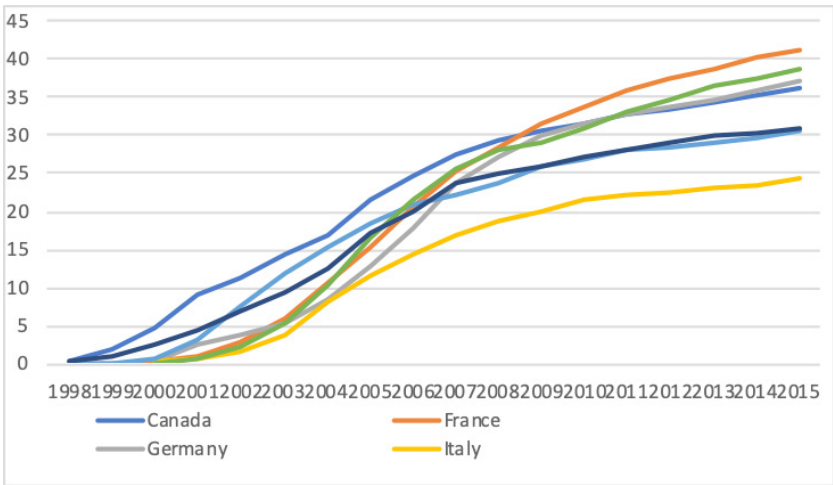
cabinets abandoned all over the Italian territory. A simple search on Google images, using the keywords ‘*Socrate*’ and ‘Telecom Italia’, calls up a long series of cracked, dismantled cabinets and plenty of broken and hanging cables. The web pages resulting from the same keywords contain several comments written by users and specialists from local communities, specialized forums and blog articles: the majority of these comments complain about the ‘waste of public money’<sup>58</sup> or the impossibility of replacing the cables in private buildings because of TIM’s excuses such as ‘sorry but we do not own the cables anymore, we can’t do anything about it.’<sup>59</sup> In southern cities such as Naples and Bari the presence of *Socrate* cabinets remains pervasive. Just like old technological ruins, these material traces are ancient markers of a past about which most people are completely uninformed; *wreck-nodes* of an invisible and forgotten network.

As tangible and visible objects, the ruins of *Socrate* are signs that Italy has slipped behind in the matter of broadband infrastructure over the last 20 years. In fact, *Socrate* was the last attempt in Italy to create an articulated and comprehensive fibre-optic infrastructure; moreover, the troubled political and economic path of Telecom Italia over the last two decades has also resulted in a high level of fragmentation in terms of infrastructure management and unsuccessful cooperative projects.

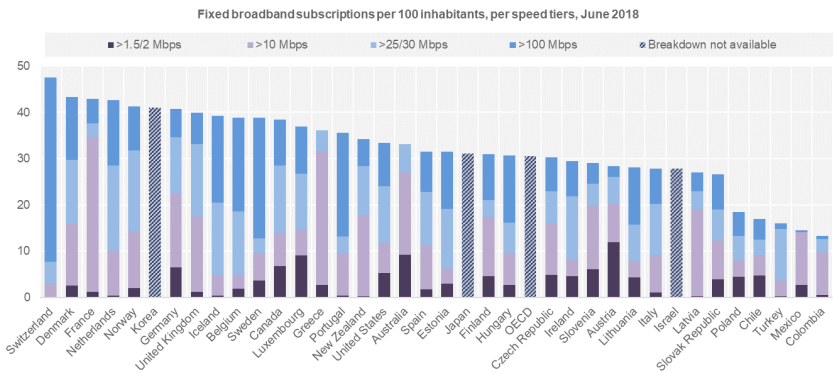
The result is that, nowadays, it has become a commonplace to refer to the backwardness of Italy in the digital sector. Notwithstanding the success of technologies such as mobile telephony, it is clear that the country needs to gain ground both in the digital infrastructure field and in Internet use percentage; in these aspects, Italy lags far behind many other European and non-European countries. For example, in 2015, Italy was in last place out of the G7 countries for fixed broadband subscriptions (Tab. 1). In 2018, Italy had one of the lowest rates of ultrabroadband connections in the OECD (Tab. 2). Since 1998, Italy has been last among the G7 countries (Tab. 3), and one of the last among European countries in terms of Internet use; only 66% of Italians uses the Internet every day, while 30% do not use the Internet at all (Tab. 4).

In order to recover from this critical situation, the Italian government has recently made an effort to facilitate the process of wiring the nation with fibre-optic cables so as to align Italy with the European goal of an extended ultrabroadband network by 2020.<sup>60</sup> The new project, called *Open Fibre*, is guided by another key Italian company: Enel, the Italian manufacturer and distributor of electricity and gas. Since Telecom Italia has been sold to foreign investors, Enel is now considered the sole Italian company able to provide the new infrastructure, even if it has to compete with other national and international actors (TIM included).<sup>61</sup>

From a narratological perspective, it is interesting to note that Italian newspapers described the new project by adopting a narrative quite similar to that used 20 years ago when the *Socrate* project was launched. The narrative

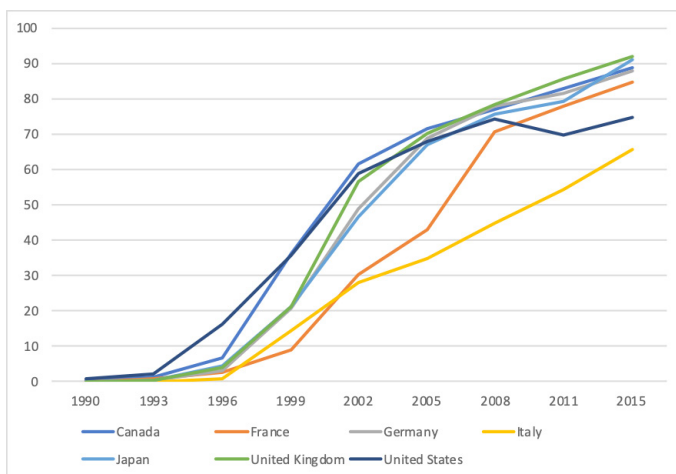


**Table 1:** Fixed broadband penetration in G7 countries, 1998–2015 (subscriptions per 100 inhabitants).  
In 2015 the penetration in Italy was 25% compared to 42% in France, and 32% in the US and Japan. Previous data is not available. (Source: Author’s elaboration of ITU data).



**Table 2:** Percentage of broadband and ultrabroadband connections.  
In 2018 Italy occupied one of the last positions, with only the 3% of FO subscriptions. (Source: OECD Broadband Statistics).

continuity between the two different times is evident if we look at the following excerpts taken respectively from a 1996 article by the leading national newspaper *La Repubblica* and a 2017 article by the magazine *L'Espresso*, ironically titled ‘Narrowband’ (*Banda Stretta*):



**Table 3:** Percentage of individuals using the Internet in G7 countries. In contrast to other countries, Italian Internet subscriptions started to grow in the late 1990s-early 2000s. (Source: Author's elaboration of ITU data).

	Proportion of individuals who:			Frequency of use (on average)	
	Used internet within the last 3 months	Used internet within the last 12 months	Never used internet	Every day or almost every day	At least once a week (including daily use)
EU-28	82	84	14	71	79
Belgium	87	87	11	74	84
Bulgaria	59	62	33	49	58
Czech Republic	82	83	13	65	79
Denmark	97	97	2	89	94
Germany	90	91	8	78	87
Estonia	87	88	10	77	85
Ireland	82	83	15	70	79
Greece	69	70	28	57	66
Spain	81	81	17	67	76
France	86	88	10	70	82
Croatia	73	74	23	63	71
Italy	69	71	25	66	67
Cyprus	76	76	23	69	74
Latvia	80	81	17	68	77
Lithuania	74	75	22	60	72
Luxembourg	97	98	2	93	97
Hungary	79	81	19	71	78
Malta	77	78	21	70	76
Netherlands	93	94	5	86	92
Austria	84	85	13	72	82
Poland	73	75	22	57	70
Portugal	70	71	26	60	68
Romania	60	66	30	42	56
Slovenia	75	76	22	64	73
Slovakia	80	83	15	68	78
Finland	94	94	4	85	91
Sweden	93	95	3	85	91
United Kingdom	95	95	4	88	93
Norway	97	98	2	92	96
FYR of Macedonia	72	75	23	61	70
Turkey	58	59	39	49	55

**Table 4:** Percentage of individuals using the Internet in Europe in 2016. Italy has one of the lowest daily (66%) and annual (71%) rates. (Source: Eurostat).



Code name: Socrate project. Expected costs: between 10 thousand and 13 thousand billion. Objective: Fibre-optic cabling of the 19 major Italian cities in order to serve ten million citizens in just a few years. The protagonist and sole actor of the operation: Stet-Telecom, *the Italian telecommunications giant*, which, thanks to Socrate, *wants to bring the Bel Paese into the digital era*.<sup>62</sup> (La Repubblica 1996: 29, emphasis added)

It's been more than a year since, on 7 April 2016, Matteo Renzi announced from Palazzo Chigi his plan *to cable Italy and bring it into the digital era*. The pivot of the project was Enel, *the state power giant*, which, coming out of the natural sector, has to lay fibre-optic cables over the entire national territory.<sup>63</sup> (Piana 2017: 58, emphasis added)

In both cases a national company, a *giant*, takes the responsibility for *bringing the country into the digital age*; in the latter case the *digital age* seems to be something that has still to take place, an historical process still *in fieri*, notwithstanding its redundant persistence in Western vocabularies and debates at least since the early 1990s.

In a certain way, the myth of the digital or network society, and the expectations of the imminent rise of this age, replicate a narrative of the ideal of progress which has permanently characterized the nineteenth and twentieth centuries; it is not by chance that broadband infrastructures recall at a discursive and imaginary level *modern* symbols such as rail networks and highways (information superhighways).<sup>64</sup> Nevertheless, seen from outside, the ruins of *Socrate* differ from the ruins of the industrial age essentially because an important portion of their 'body' is still underground. Whereas factories and rail stations are ruins visible in all their magnitude, the cabinets of *Socrate* recall more the top of an ancient and undiscovered building, an archaeological artefact which is still buried in the ground. Recently, TIM reused the *Socrate* cabinets as new boxes for fibre-optic cables (Figs. 17–18), adopting a strategy of overlapping characteristic of communication infrastructures (Starosielski 2015a). Besides this material overlap between the new efficient and the old failed infrastructures there is also a sort of narrative renewal of the corporate image promoted by the new company; this narrative relies on an 'old' but exemplary figure. Notably, the 2017 commercial for the new TIM brand stars, with a special testimonial, Tim Berners-Lee. The commercial shows a series of technological artefacts (fibre-optic cables, touch screens, digital images and so on) while Berners-Lee talks about positive values such as cooperation, the importance of the sharing of knowledge and the necessity of listening. Whereas the new fibre-optic leader Enel points to the importance of 'getting powerful technology' by making claims such as 'The fibre, in all its purity, gets into your house' or 'Get into the Internet age',<sup>65</sup> TIM promotes its new brand through the figure of Berners-Lee, the symbol of the distributed communication model which coincides with the Web. The reference to the Web as a bearer of value is clarified by Berners-Lee



**Figures 17–18:** An abandoned cabinet of the *Socrate* project and a re-used one, in Naples.

A small new cabinet has been added to the old one. The new cabinet is branded with the logo of the optic fibre TIM). Sources: Fig. 17 – <https://www.tomshw.it/dal-progetto-socrate-piano-enel-sorto-fibra-75971> (Accessed 20 January 2020). Fig. 18 – Picture taken by the author on 12 October 2018.

himself, who ends the commercial by presenting himself and saying, ‘My name is Tim Berners-Lee, I invented the Web’ (TIM 2017). Whereas the new leading business player Enel seems to follow an imaginary in continuity with the past and rooted in the past experiences of Telecom Italia, TIM seems to leave behind its material and narrative ruins by turning towards a new narrative based on the horizontal construction of the future.

From a network infrastructural perspective, the strategy adopted by Enel is not surprising; connectivity is here perceived as energy, so it has to be distributed by flows; and flows, especially electric flows, are usually asymmetric and centralized.

### 3.7 Legacy Systems

In his work on the history of the failed Soviet Internet project, the media historian Benjamin Peters argues:

Beneath the modern imagination of smooth steel-brushed machines interlinked by wires, signals, and smart protocols pulse the vibrant social networks of relations whose virtues and vices have long been part of the human condition. To understand modern networks is at root an exercise in social self-discovery. (Peters 2016: 203)

Similarly, the French historian Valérie Schafer (2015) has stressed the importance of looking at the histories of networking both as technological and *human* histories in which communities, individuals and organizations play a key role by investing in innovation, selecting business strategies, adopting policies and imagining different applications of both networking tools and infrastructures.

In line with this perspective, this chapter has shown how the Italian network imaginaries are deeply rooted in the social and historical dimensions characterizing social groups, communities of interest, or, in some cases, an entire nation. With regard to the last aspect, it is important to clarify that national imaginaries are not discrete and impenetrable; rather they incorporate some elements from the collective imaginary, an imaginary that exists beyond geographical boundaries. But at the same time, national and local imaginaries are able to reinterpret and reframe collective ones. National companies and city administrations tend to mix the global picture with the local one in the wake of their cultural experiences, traditions or, in other words, histories. It is in line with this idea that the Italian sociologist Alberto Abruzzese claims that in the digital age ‘it is impossible to tell histories of the national collective imaginaries, we can tell only national histories of the collective imaginary.’<sup>66</sup> (Abruzzese 2001: 56).

*Socrate* is an exemplary story in this sense. On the one hand the entire project, and the narrative that Telecom Italia used to promote it, resulted from a vision of the digital age widely shared in Western cultures. This was a vision based on keywords such as infrastructure, multimedia and convergence. On the other hand this narrative was partially reinterpreted and influenced by

Italian technological and cultural history. The broadcast of the *Socrate* network was planned by means of a vertical distribution of infrastructures, of contents and, in turn, of power. This conceptualization of the network was part of an imaginary deeply rooted in the political history of Italy. Furthermore, from a media studies perspective, Telecom Italia's move from telecommunication to broadcasting services revealed the weakness of a company that created an *Italian telecommunication style* (Fari et al. 2014; Ortoleva 2000) but decided to deal with a medium that had never been part of its core business. As the Italian journalist Giorgio Meletti argued just a few months after the failure of *Socrate*:

The fibre-optic network wanted by Pascale was not like the telephone line, which allows anyone to connect with anyone, but was rather like an aqueduct, with the broadcast signal from above which was then spread to homes through a tree-based scheme. It was another network, with no connection to the telephone line: a cable TV.<sup>67</sup> (Meletti, 1998)

For the analysis of the imaginary, the broadcasting model, which corresponds to a networking model even if different from the distributed one, goes far beyond the narrow utilitarian and functionalist media framework, or, in other words, from the idea of media as mere *means* of communication. Rather, the broadcasting model incorporated in *Socrate* is an organizational and communicative structure that has greatly influenced the Italian path to the Internet in general during recent decades.

In an essay that is likely to become a classic of media studies, John Durham Peters (1999) argues that the history of communication can be summarized in terms of a tension between a model based on dialogue, where Socratic philosophy is the key reference, and a model focused on the dissemination of information, characteristic of Christian philosophy. Semantically switching the role of these two concepts, the missing *dissemination* (the desire to disseminate infrastructure from the top) of *Socrate* can be attributed to a lack of *dialogue* (horizontal exchange) between the different players – political, social and cultural institutions – of a 'national system' that Ernesto Pascale invoked in vain during those years. In sum, Telecom Italia attempted to *disseminate* the network without being able to *dialogue* with the political, economic and social forces of the country: witness the lack of cooperation with some excellent civic networks such as *Iperbole*; the conflict with some 'resistant' key municipalities such as Milan; the lack of agreement with national broadcasters; the conflict between Pascale and the government's political forces; the lack of an integrated effort to effectively spread digital literacy in the country. All these missing forms of dialogue, and thus necessarily of 'network coordination', contributed to decisively stymie the development of digital infrastructures and, in turn, of Internet use in Italy.<sup>68</sup>

Seen in these terms, an ambitious project like *Socrate* does not only represent a failed strategy at the national level, but also represents an imaginary that intertwines different layers of the vast media landscape of our time. As a long tradition in media and sociological studies has repeatedly argued – even if from different points of view<sup>69</sup> – media, and in turn the networking models they represent, rather than being *means*, should be seen as *ways of being*; media incorporate social structures, communicative models and power relations, yet they are at the same time material projections of the imaginary and bearers of collective values. In this regard, the network imaginary of Telecom Italia was based on the dissemination paradigm, which was interpreted as the best and more convenient solution both for the preservation of the company's leadership and for the digital growth of Italy at European and global levels.

*A posteriori*, Telecom Italia's corporate image, as reflected in the tales of those who lived through the 'golden years' of telecommunications in Italy, is that of a company with a great future behind it. The failure of *Socrate* is just one example among many of how the technological dimension, the political sphere and the imaginary interact with each other. In this sense, taking a step backwards and reflecting on the multiple dimensions of the histories and the imaginaries of networking is not only useful for a better understanding of the continuity and breaks with the past, but it is crucial in order to interpret the present condition and the future role of digital technologies in our societies.

Nowadays, the 'broadcastization' of both network contents and infrastructures is part and parcel of this history. Even if situated in the very specific context of Italy, the histories of *Socrate* and *Iperbole* represent the intrinsic complexity and plurality of network imaginaries, as well as their theoretical contradictions; their histories underline the limits of any deterministic and mono-causal vision of the past, present and future of information technologies. Media and social imaginaries should be in this sense integrated and compared in order to unveil the hidden sides of the histories of networking; these forgotten histories, and in turn the imaginaries that lie behind the conceptualization and the realization of failed, but also temporary successful, digital networks, can reshape and contradict what is taken for granted. Such histories can not only help to avoid the mistakes of the past and to see the reiteration of past visions in the present, but can also keep people informed about the meaning of local, national and international choices, strategies and policies.

It is crucial to reiterate some key assumptions: computer networks did not, and will not, develop 'naturally' as distributed models, and networks are not self-fulfilling prophecies. Networks are, rather, social and historical products rooted in cultural, technological and social histories; they take shape through the balance of economic, political and social forces; they result from a series of strategic choices and greatly depend on the collective awareness of their potential effects, as much as of their potential limitations.

## Notes

- <sup>1</sup> However, some attempts to create a European system for data sharing were made in the 1970s and 1980s. See for instance the history of Euronet as sketched by Kerssens (2019). Another forgotten history that would need in-depth research is the case of ‘Alexandria’, Robert Cailliau’s attempt to create an European version of the Web at CERN.
- <sup>2</sup> The company was founded in 1899 as the *Hydroelectric Society of Piedmont – Società Idroelettrica Piemontese*, and then renamed SIPTel in 1925. In 1964, after a change in corporate structure, the name changed to *Società Italiana per l’esercizio telefonico*.
- <sup>3</sup> From now on, I will use the name Telecom Italia to also refer to the SIP period.
- <sup>4</sup> The European Directives 90/387/EEC and 90/388/EEC of 1990 led to the abolition of public monopolies starting from 1998 and the consequent opening-up of markets to new operators in the telecommunications sector. Sources: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:1990:192:TOC> (Accessed 20 January 2020)
- <sup>5</sup> The following excerpt from Directive 387 is particularly meaningful to the subject of this chapter:

‘The digitization of the network and the technological improvement of the terminal equipment connected to it have brought about an increase in the number of functions previously carried out within the network and which can now be *carried out by users themselves with increasingly sophisticated terminal equipment*. It is necessary to ensure that suppliers of telecommunication services, and notably suppliers of telephone and packet or circuit-switched data transmission services enable operators to use these functions’. (European Directives 90/387/EEC 387: 26, emphasis added)

- <sup>6</sup> For an exhaustive overview of the history of the STET holding see Bottiglieri 1987.
- <sup>7</sup> Source: Telecom Italia (1995) *Relazioni e Bilancio al 31 Dicembre 1994*. The data compare the top 20 Telecom Industries worldwide. Nevertheless, a key country, China, is not included in the ranking.
- <sup>8</sup> OT: ‘C’era uno spirito di forte collaborazione fra gli stati e fra le aziende europee. A fine anni Novanta si sarebbe affacciata la competizione con l’introduzione di traffico di terzi con la liberalizzazione. Il mobile infatti sarebbe nato in un contesto competitivo, mentre per il mondo della circolazione dei dati sulle reti pubbliche c’era la massima collaborazione sugli standard e noi eravamo leader.’
- <sup>9</sup> OT: ‘L’imbrication croissante des ordinateurs et des télécommunications — que nous appellerons la «télématique» — ouvre un horizon radicalement



neuf. Ce n'est certes pas d'hier que les moyens de communications structurent les communautés : routes, chemins de fer, électricité, autant d'étapes d'une organisation familiale, locale, nationale, multinationale. La «télématique», à la différence de l'électricité ne véhiculera pas un courant inerte, mais de l'information, c'est-à-dire du pouvoir. La ligne téléphonique ou le canal de télévision constituent les prémisses de cette mutation. Ils se fondent aujourd'hui dans des transmetteurs polyvalents, commencent à relier des ordinateurs et des bases de données, disposeront bientôt, grâce aux satellites, d'un outil impérial. La télématique constituera non pas un réseau de plus mais un réseau d'une autre nature, faisant jouer entre eux images, sons et mémoires: elle transformera notre modèle culturel.'

- <sup>10</sup> Similar reports were written in the same period in other European countries such as England and Germany. For example, the *KTK Report* written by *The Commission on the Future of Telecommunications in the Federal Republic of Germany* shared several points in common with Nora & Minc (see: Kaiser 1977). Similarly, the Italian telecommunication research centre CSELT followed Nora and Minc's ideas. According to the former managing director Cesare Mossotto, in fact, people working at CSELT 'appreciated the considerations of the *Nora report* on the development of widespread telematics (Videotel) and the role that telecommunications had to play: the emergence of the "network centric" concept was opposed to the "centric host" (it would be better to say "mainframe centric") which was stubbornly pursued by IBM.' (Mossotto 2011: 382)

OT: 'Si apprezzavano le considerazioni del Rapporto Nora sullo sviluppo della telematica diffusa (Videotel) e sul ruolo che le telecomunicazioni avrebbero potuto giocare: nascita del concetto di "network centric" in opposizione a quello di "host centric" (sarebbe meglio dire "mainframe centric") allora ostinatamente perseguito da IBM.'

- <sup>11</sup> OT: 'Le fait que le terme américain mette l'accent sur l'informatique – computer – et le nôtre sur les télécommunications n'est pas un hasard. Il exprime un rapport de forces qui, en France, privilégie ces dernières.'
- <sup>12</sup> The telex is a switched network of teleprinters similar to a telegraphic network; it was employed in several countries starting from the 1930s.
- <sup>13</sup> OT: Con l'arrivo del pacchetto nel 1974 si parlò di sviluppo europeo delle reti, ci fu infatti Euronet che era una rete a pacchetto europea. Siccome dovevano entrare gli stati noi come Poste creammo il primo centro di commutazione a Via Trastevere. In Italia il problema era che il ministero aveva conservato le comunicazioni e io ero il responsabile comunicazione delle Poste quindi ero il difensore dei dati gestiti dal ministero. Noi avevamo dato in concessione alla SIP la telefonia, loro dicevano che i dati erano telefonia e qui c'è stata una lite che è durata fino al 1988 perché il ministero aveva ancora come gestione diretta il Telex che era l'inizio della trasmissione dati.
- <sup>14</sup> OT: Negli anni '70 la parola dati voleva dire tutto e il contrario di tutto. In questo scenario nasce la commutazione di pacchetto e tutti si chiedevano

‘da che mondo viene questa cosa? Dal mondo fonia o dal mondo telex?’ Era una cosa nuova. C’era una sottile battaglia continua col ministero perché noi come SIP chiedevamo di gestire la rete perché veniva dalla fonia e dovevamo farla noi, il ministero diceva la rete nasce come telex dati ed è roba nostra.

<sup>15</sup> Enrico Mattei is a well-known figure in Italian history since he founded the Italian petrol company ENI (*Ente Nazionale Idrocarburi*), contributing to the economic growth of Italy after the Second World War.

<sup>16</sup> The first 19 cities included in the project were (in alphabetical order): Bari, Bologna, Cagliari, Catania, Firenze, Genova, Messina, Milano, Napoli, Palermo, Parma, Pisa, Roma, Siena, Torino, Trento, Trieste and Venezia.

<sup>17</sup> *Résau* (which means ‘network’ in French) was the first Italian ICT consulting company. Francois De Brabandt, one of the main ICT experts in Italy, funded it.

<sup>18</sup> OT: ‘La nostra società operativa Telecom cablerà l’Italia, investirà diecimila miliardi di lire e darà al Paese l’autostrada digitale di cui ha bisogno.’

<sup>19</sup> The acronym DECT stands for *Digital Enhanced Cordless Telecommunication*. The project Fido-DECT (1995–2001) was an attempt to bring telephone coverage out of the domestic wall by means of cordless phones and external repeaters; it was a sort of ‘low range’ mobile phone. A very similar project, named Bi-Bop (1991–1997), failed in France in the same period. The importance accorded to these projects by telecommunication companies highlights the centrality of mobile telephony for national telecommunication market strategies in the 1990s. According to Pierre Musso (at the time Musso was part of the Board of Directors of France Télécom): ‘The mobile phone was at the center of discussion far before the smart-phone. France Telecom executives thought that the mobile phone would be the future of communications and did not really believe in the Internet; they considered it an American toy.’ (Pierre Musso, private communication, 8 June 2017)

OT: ‘Si parlava prima di tutto del telefono mobile ben prima dello smart-phone. France Telecom i dirigenti pensavano che il telefono mobile sarebbe stato il futuro delle comunicazioni e non credevano assolutamente in Internet, lo consideravano un giocattolo americano.’

The Italian and the French press have frequently complained about the waste of economic resources and labour due to these projects. For the Italian case, see: <http://www.repubblica.it/online/economia/fido/fido/fido.html>.

For the French case, see: [http://www.lexpress.fr/informations/bi-bop-le-big-flop-de-france-telecom\\_624438.html](http://www.lexpress.fr/informations/bi-bop-le-big-flop-de-france-telecom_624438.html).

<sup>20</sup> The two projects *Progetto 80* and *Festoni* placed Italy in an average position concerning long-distance broadband infrastructures at a European level.

<sup>21</sup> One of the reasons behind this choice was that the HFC was adopted in the US for cable transmissions.

- <sup>22</sup> At the present stage, even to the generic user, both the down- and up-stream bandwidths would look ridiculous. Nevertheless, a 1.5 Mb downstream connection was considered to represent extremely high performance compared to most European countries.
- <sup>23</sup> OT : 'La televisione era il calcio insieme ai telegiornali per la politica, per i politici e l'opinione pubblica. Se toccavi queste cose era grave, delle altre nessuno se ne importava ma se toccavi queste toccavi una ripartizione tra i vari network tv.'
- <sup>24</sup> According to Davide Giacalone and Maurizio Matteo Dècina, both authors of critical books about the disastrous privatization process of Telecom Italia, Ernesto Pascale had to leave STET mainly for political reasons since the new Italian establishment needed a more 'loyal' and less independent leadership in the telecommunication sector (Dècina 2013; Giacalone 2004).
- <sup>25</sup> In these cases, Telecom Italia subtly claims that *Socrate* failed because of the 'delicate political moment.' See: <http://www.telecomitalia.com/tit/it/innovazione/rete/le-prime-infrastrutture.html> (Accessed 20 January 2020).
- <sup>26</sup> The removal of these troublesome aspects regarding the history of the company recalls what Wilner et al. call the 'pasteurisation' of corporate narratives. According to the authors, thanks to the pasteurization of corporate narratives 'germs are eliminated in the name of a simple, rational and powerful explanation.' (Wilner et al. 2014: 404)
- <sup>27</sup> Maurizio Dècina is currently professor of engineering at the University Politecnico of Milan; he was the first Italian to chair the IEEE (*Institute of Electrical and Electronic Engineers*) and he worked as manager and special consultant for Telecom Italia for a long time.
- OT: 'C'era il problema degli scavi, per mandare i cavi nelle case bisognava scavare e Socrate scavava. I comuni davano i permessi chiedendo in cambio lavori di ristrutturazione delle strade.'
- <sup>28</sup> Alberto de Petris if the former network account manager of Telecom Italia.
- OT: Si trattava fondamentalmente di scavare. C'erano luoghi come Napoli dove si trovavano le cose più strane e la documentazione spesso non corrispondeva alla realtà. C'erano attraversamenti impropri di altre società che avevano distrutto le canalizzazioni fatte da noi.
- <sup>29</sup> OT: 'Fare la rete in Italia costa poco dal punto di vista economico. Quello che costava molto era scavare! L'80% delle raccomandazioni al ministero erano per convincere i comuni a scavare. Scavare significava non solo coprire : significava fare trincee di 70 cm, sotto mettere la breccia, sopra mettere la sabbia, sopra mettere il passacavo, in certi posti addirittura la polifera. [...] Sono un sacco di soldi!'
- <sup>30</sup> Before the launch of the project, the ADSL was taken into account as a possible solution, but the board discarded the idea because the technology was not evolved enough.

- <sup>31</sup> ITU statistics calculate indicate that in 2015 that there were more than 118 million subscribers to ADSL services in Europe. Source: elaboration of ITU statistics.
- <sup>32</sup> OT: C'era tutto ma probabilmente mancava il mercato. [...] Tecnologia e mercato non si incontravano. tecnologia e mercato non si incontrano, anche perché l'offerta del digitale televisivo continua ad aumentare grazie ai satelliti e ai dvd reperibili quasi ad ogni isolato da distributori automatici o negozi specializzati. [...] come se non bastasse a questa crescente abbondanza di contenuti e punti di approvvigionamento nella seconda metà degli anni '90 arriva Internet a rimescolare le carte.
- <sup>33</sup> Ivano Camerano wrote his Master's thesis in engineering on the *Socrate* project during the academic year 1994–1995. I found his thesis at the *Archivio Storico Telecom Italia* by pure chance, so I asked at the reception desk if he eventually started to work for Telecom Italia. And indeed, after the completion of his dissertation, he started working for Telecom Italia as an electronic engineer and it emerged that his office was at the second floor of CSELT. Thus we were in the very same building and I had the opportunity to interview him there.
- <sup>34</sup> OT: Da un'indagine a posteriori a metà anni novanta si è capito che era troppo presto. Primo perché la tecnologia non era così matura da fornire un'infrastruttura che potesse davvero essere utile, aldilà dei progetti e dei sogni, a fornire qualcosa di valore in termini di larga banda. Soprattutto però il principale problema era che noi italiani e europei non eravamo pronti alla larga banda in materia di servizi. Si diceva 'potremo avere migliaia di informazioni e di servizi VOD' però stringi stringi non eravamo abituati, ci mancava proprio la mentalità di questo approccio.
- <sup>35</sup> The University College of London (England) and Royal Radar Establishment (Norway) were the first two institutions to be connected with the ARPANet project in 1973 by satellite transmission.
- <sup>36</sup> The seven centers constituting the leading group of the GARR network were: Milan (CILEA), Bologna (CINECA-ENE-INFN-CNAF), Pisa (CNR-CNUCE), Rome (INFN), Frascati (ENEA & INFN) & Bari (CSATA).
- <sup>37</sup> For an overview of the Agenda Digitale Italiana, see: <http://www.agid.gov.it/agenda-digitale/agenda-digitale-italiana> (Accessed 20 January 2020).
- <sup>38</sup> <http://www.telecomitalia.com/tit/en/innovazione/rete/Internet-day.html>.
- <sup>39</sup> IPerBOLE is an acronym which stands for *Internet 'For' Bologna and the Emilia Romagna*.
- <sup>40</sup> *Iperbole* made an agreement to exploit part of the Internet bandwidth of the CINECA supercomputing centre. The first ISPs reported the municipality to the authorities for unfair competition, but *Iperbole* won all the trials because the server through which CINECA received its Internet connection was based in Paris, outside Italian jurisdiction.
- <sup>41</sup> The *Iperbole* project won several prizes at European and international level, and it was also recommended as a best practice to imitate during the G7

summit on the information society held in Halifax, in 1995. As stated in an official document: 'Bologna, in Italy provides the "Iperbole System" for its citizens. This is a free of charge civic network on the Internet. Iperbole allows citizens to address messages to the city government in a free-form way. [...] Thousands of e-mail messages are exchanged daily. There are many active discussion groups. The Iperbole system in Bologna, Italy may be a model for all governments.' (McDonough 1995: 2)

<sup>42</sup> OT: 'Si deve assumere come punto di partenza la constatazione che la tecnologia rende da ora in poi possibile una vasta serie di applicazioni di democrazia diretta e reale: diretta in quanto svolta in prima persona, senza la mediazione della rappresentanza; reale, in quanto interattiva e bidirezionale, e non a senso unico. Il Progetto non soltanto trova nel Comune di Bologna un soggetto interessato alle tecnologie e un contesto favorevole e naturale in cui collocarsi: la città è in questa fase il soggetto strategico imprescindibile per favorire il decollo della democrazia informatica. In questa congiuntura politica, caratterizzata dalla sempre maggiore incidenza del potere televisivo, con i suoi filtri e i suoi linguaggi semplificatori sul modo di conformarsi della democrazia, è di fondamentale importanza che gli enti locali consapevoli dell'importanza della disseminazione dell'informazione e della massima ampiezza del dibattito pubblico si facciano pionieri di esperimenti di democrazia dal basso.'

<sup>43</sup> OT: L'innovatività di un progetto come il presente è legata quindi anzitutto al ruolo attivo, consapevole e strategico del soggetto pubblico nello stimolare la democrazia informatica e la trasparenza amministrativa e nell'orientare il futuro utilizzo delle comunicazioni via cavo verso direzioni di partecipazione collettiva e a basso costo piuttosto che ad una ulteriore articolazione del business dello spettacolo e dell'informazione-spettacolo per profitto. Un altro aspetto innovativo, di grande valenza politica, è quello della formazione dell'utenza. [...] Essere in una rete locale democratica significa non soltanto fornire macchine e istruire sul software, ma soprattutto alfabetizzare, educare a scrivere, a rispondere, a leggere, a far girare in modo opportuno l'informazione, a cercarla in modo efficace, a saperla trovare. A creare un'utenza che dialoga attivamente e in modo civile, che sappia argomentare le proprie proposte e cercare i propri interlocutori. In sintesi, qui si tratta della forma mentis della comunicazione interattiva, contrapposta al paradigma televisivo, in cui il cittadino è concepito come spettatore passivo di fenomeni alla cui determinazione non è chiamato a partecipare. Solo un ente locale democratico quale una amministrazione eletta e i cittadini stessi possono avere la volontà politica e la capacità concreta di rompere i lacci di un modello superato, e sviluppare una reale democrazia elettronica.

<sup>44</sup> These processes have also characterized the history of other *alternets* such as radio, telephonic and Internet networks in several countries such as France, England and the US (e.g., Trudel & Tréguer 2016).

- <sup>45</sup> In another influential book Deleuze and Guattari list the six principles of the rhizomatic model as follows: '1 and 2. Principles of connection and heterogeneity: any point of a rhizome can be connected to anything other, and must be. [...] 3. Principle of multiplicity: it is only when the multiple is effectively treated as a substantive, "multiplicity," that it ceases to have any relation to the One as subject or object, natural or spiritual reality, image and world. [...] 4. Principle of a signifying rupture: against the over signifying breaks separating structures or cutting across a single structure. A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines. [...] 5 and 6. Principle of cartography and decalomania: a rhizome is not amenable to any structural or generative model'. (Deleuze & Guattari 1987: 7-13)
- <sup>46</sup> OT: Nel 1977 Deleuze e Guattari pubblicano questo librettino che per noi era come il libretto rosso di Mao, Rizoma. Dicevano che la storia del capitalismo occidentale è fondata sull'albero e sull'ordine gerarchico ma noi adesso scopriamo un modello della vita sociale fondato sul rizoma, un sistema totalmente acentrico in cui ogni punto è il centro del mondo. Il concetto di rizoma appariva a noi come il modello utopico della società da costruire, di quello che stavamo facendo effettivamente con le radio libere! Dicevamo 'siamo sulla strada giusta!' Io venivo dall'esperienza della radio libera in cui il tema l'avevamo già percepito in Italia soprattutto con radio Alice, avevamo sempre insistito sul fatto che la radio è un medium centrico ma con il telefono diventa un medium a-centrico. [...] Oggi capisco che noi avevamo interpretato come il sole dell'avvenire quella che era la nuova tappa della storia del capitalismo. La forma rizomatica è la forma che il neoliberalismo interpreta sul piano politico e che la connessione tra Internet e le grandi corporation di produzione immaginaria realizzano sul piano produttivo.
- <sup>47</sup> The national press tended to overexpose and intensify this conflict, see: <http://ricerca.repubblica.it/repubblica/archivio/repubblica/1996/03/21/scontro-sul-monopolio-stet-il-cablaggio.html>
- <sup>48</sup> OT: Io ho bloccato Socrate a Bologna. Io bloccai Socrate per anni perché era una follia, per loro era importantissimo passare da Bologna per ragioni di geografia e topologia di rete. Quasi mi emozionai perché nessuno se lo ricorda ma fu una battaglia pazzesca. Pascale veniva in aereo privato nel mio ufficetto in comune a pregarmi di far passare il progetto a Bologna. Ogni tre giorni e noi non gli davamo il permesso di scavare. Proponemmo un progetto alternativo, Optubi, che era il contrario di Socrate. L'idea era usare le fogne, i tubi dell'elettricità per abbattere i costi e soprattutto per democrazia economica perché si potevano mettere più cavi anche per la concorrenza e il comune gestiva il territorio. Non solo, il comune ci guadagnava perché conferiva più di metà del valore dello scavo. Poi il comune oggi regala a tre aziende private il territorio per la banda ultra-larga dove il lui è semplicemente 'facilitatore'. Il comune non aveva nessun controllo



dal punto di vista politico e sociale, di nessun tipo. A questo aspetto sono affezionatissimo. Iperbole è un acronimo di Internet Per Bologna e l'Emilia Romagna. Socrate invece reiterava un reato che è andato avanti per decenni nell'economia italiana. Noi siamo stati per decenni arretratissimi perché è finito quel progetto che era come le autostrade del sud, autostrade vuote.

<sup>49</sup> OT: Noi non abbiamo mai sposato la linea della Telecom. Loro lanciarono il piano Socrate, parecchia roba ne fecero. Posavano la fibra ma questo ha fatto la fortuna di Fastweb che ha comprato i cavidotti. [...] ... si è data tanta importanza al cablaggio in quegli anni, l'errore dal punto di vista di politica delle reti è che andavano pensati prima i servizi e poi il cablaggio.

<sup>50</sup> OT: Il piano Socrate ha peccato di determinismo tecnologico. In quegli anni la convergenza era un discorso ambiguo. Era basato principalmente sulla tecnologia, con l'idea che sulla stessa infrastruttura si può trasmettere tutto. Era una convergenza tecnica ma pochi avevano fatto una riflessione sulla convergenza della gestione dei servizi. Il ragionamento principale era sul contenitore. Poco ragionamento fu fatto sui contenuti.

<sup>51</sup> OT: La rivoluzione multimediale non avviene spontaneamente: è necessaria infatti la disponibilità in tempi brevi di infrastrutture di telecomunicazioni a larga banda, che consentono cioè la contemporanea trasmissione di servizi in voce, dati e video, diffuse sul territorio e accessibili a costi contenuti. Tale infrastruttura (che può svolgere le stesse funzioni della rete ferroviaria durante la prima rivoluzione industriale e che rappresenterà il tratto distintivo dei paesi sviluppati) è essenzialmente costituita dal cablaggio del territorio con la fibra ottica.

<sup>52</sup> It is not by chance that railway networks in Italy were the most important infrastructures for the inter-connection of the country at the end of the nineteenth century.

<sup>53</sup> OT: Cablare è l'evoluzione tecnologica delle telecomunicazioni, lo faremmo per il telefono anche senza il mercato multimediale interattivo. Anticipiamo nel tempo investimenti che andranno fatti per stimolare l'offerta di servizi. [...] Nel mercato multimediale sono confidentissimo, sono certo che siamo all'inizio di un'epoca che cambierà il nostro modo di operare. *Sento nella mia carne* che ciò avverrà, questo significa maggiori investimenti, nuovi soggetti e maggiore occupazione.

<sup>54</sup> OT: Si sta per aprire una nuova rivoluzione. Avverrà nel 1997 con la televisione multimediale interattiva, quella sarà la vera rivoluzione. Oggi siamo in una fase preliminare. [...] Si aprirà una catena di scambio, la cosiddetta società dell'informazione, soprattutto nell'entertainment. Una nuova tv si andrà ad aggiungere alla tv generalista con la quale entrerà in competizione. Il tele shopping e le catene di distribuzione stesse cambieranno. Questo vale anche per le banche, per i tour operator e per l'educazione. Si apre un mondo aggiuntivo, integrativo e in parte sostitutivo che offre delle possibilità enormi.

- <sup>55</sup> OT: Pascale era molto determinato. [...] Ricordo un episodio quando eravamo assieme a Londra per parlare con i manager cinesi di un offerta in Cina. Uscendo dall'albergo a Londra vedemmo degli operai che stavano posando dei cavi per una compagnia americana. Pascale disse "Lo vedi? Questi fra poco ce li troviamo a casa nostra! Prima che lo facciano loro dobbiamo farlo noi" Così parti Socrate: 10000 miliardi per passare in 10 milioni di case. [...] Internet era come non esistesse. Ricordo Maurizio Dècina quando venne con Vittorio Trecordi nel mio ufficio e disse "ti voglio far conoscere Internet". Trecordi si connesse e io ricordo che sentii un misto tra angoscia e qualcos'altro. Come se fossi abbandonato nel mare. Vedere questa dimensione che si apriva e che al tempo era assolutamente sconosciuta. Per cui noi ci sapevamo muovere ma non esisteva in quel momento una strategia per Internet offerta [...]. Cercavamo di capire, in quel periodo io feci da consulente per Vint Cerf. Lo andavo a trovare ogni 4–5 mesi negli US, lui venne in Italia a fare dei seminari interni perché volevamo entrare in questo mondo. Però partito il Socrate eravamo entrati nel grandissimo successo del mobile. Noi avevamo allora due grandi strade, una era la rete a larga banda e l'altra il mobile.
- <sup>56</sup> OT: 'Ernesto concepì il progetto Socrate, ossia la cablatura in fibre ottiche del paese, per poter dare servizi e accessi avanzati a tutto il paese. Procedeva con il coraggio del pioniere e con la serenità della ragione. Anche allora quel progetto fu criticato prima e bloccato poi. Oggi il Paese ne ha bisogno e non ce l'ha ancora.'
- <sup>57</sup> According to the network account manager Alberto de Petris, if the new company TIM were to retrieve the map of the *Socrate* infrastructure, it could benefit from the old conduits for the laying of the ultrabroadband infrastructure (Alberto de Petris, private communication, February 8, 2017). Apparently, TIM is currently following his advice and, 20 years later, 'Socrate lives again'. See : <https://www.tomshw.it/fibra-ottica-tim-nelle-arterie-socrate-altro-cicuta-82507> (Accessed 20 January 2020).
- <sup>58</sup> See: <https://www.tomshw.it/telecom-socrate-fido-dect-denaro-pubblico-spreco-41191> (Accessed 20 January 2020).
- <sup>59</sup> See: <http://www.hwupgrade.it/forum/archive/index.php/t-1460494.html> (Accessed 20 January 2020).
- <sup>60</sup> See: <https://ec.europa.eu/digital-single-market/en/europe-2020-strategy> (Accessed 20 January 2020).
- <sup>61</sup> The Italian Ministry of Economy and Finance holds 23.6% of Enel's shares; therefore it is the relative majority shareholder of the company. The French company Vivendi (23.9%), together with a consistent group of foreign investors (58.13%), currently controls the TIM group, meaning that foreign investors mainly control TIM. Sources: <https://www.enel.com/it/investors1/azioni/azionisti> <http://www.telecomitalia.com/tit/it/investors/shareholders/shareholdings.html> (Accessed 20 January 2020).

- <sup>62</sup> OT: Nome in codice: progetto Socrate. Spesa prevista: fra i 10 mila e 13 mila miliardi. Obiettivo dichiarato: cablare in fibra ottica le 19 maggiori città italiane servendo dieci milioni di cittadini nel giro di pochi anni. Protagonista ed unico attore dell'operazione: Stet-Telecom, il gigante italiano delle telecomunicazioni, che grazie a Socrate vuole pilotare il Bel Paese nell'era digitale.
- <sup>63</sup> OT: È passato più di un anno da quando, lo scorso 7 Aprile 2016, Mattered Renzi annunciava da Palazzo Chigi il suo piano per cablare l'Italia intera e trasportarla nell'era digitale. Il perno del progetto era Enel, il colosso statale dell'elettricità, che uscendo dal naturale settore di attività avrebbe dovuto posare la fibra ottica sull'intero territorio nazionale.
- <sup>64</sup> According to Andrew Russell and Lee Vinsel 'to take the place of progress, 'innovation', a smaller, and morally neutral, concept arose. [...] At the turn of the millennium, in the world of business and technology, innovation had transformed into an erotic fetish.' (Russell & Vinsel 2016). In this regard, infrastructures represent the progress that the new fetishist term, innovation, provokes.
- <sup>65</sup> See: <http://openfiber.it/> (Accessed 20 January 2020).
- <sup>66</sup> OT: Non sono praticabili storie dell'immaginario collettivo nazionale, ma lo sono invece storie nazionali dell'immaginario collettivo.
- <sup>67</sup> OT: La rete in fibra ottica voluta da Pascale non era come quella telefonica, che consente a chiunque di mettersi in collegamento con chiunque, ma era piuttosto come un acquedotto, con il segnale televisivo distribuito dall'alto e diffuso verso le abitazioni con uno schema ad albero. Era un'altra rete, senza alcun collegamento con quella telefonica: una tv via cavo.
- <sup>68</sup> Of course, the failure of *Socrate* is not interpreted here as the sole cause of the digital gap in Italy.
- <sup>69</sup> E.g., the works of Walter Benjamin (2008), Cornelius Castoriadis (1978) and Marshall McLuhan (1962).