Demo-cracy in Europe

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Abstract: In recent years, the European Commission (EC) has used various forms of public demonstrations, including technological demos, to manage its research and development programs. My sociological observations of one of these programs in the field of Information Technologies contribute to showing how a "demo-cracy" — a regime using public demonstrations for the management of public affairs that gives significant power to efficient demos, talented demonstrators and the institutions that employ them — has developed at the EC level and beyond. They also help unveil the nature of a peculiar culture of public demonstrations at the EC level, and of an extensive culture of demos in the industrial world.

Keywords: Public Demonstration, Demo, European Commission, Research and Development, Information Technologies, Competition.

Demo-cracy in Europe

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In order to manage its research and development programs and to help define and implement European policies and politics, the European Commission has used various forms of public demonstrations in recent years. These include public demonstrations of technology that may be compared in some ways with Bill Gates' famous software demos.

Here, I would like to analyze the ins and outs of this peculiar phenomenon and see to what extent it can described in terms of politics and culture of public demonstrations. My argument will be mainly based on sociological observations I have conducted on the running of a large European research and development (R&D) program, "Advanced Communications Technology and Services" (ACTS).

Starting from the analysis of this social process, I would like to reflect on the social uses of public demonstrations, and to contribute to the development of a systematic framework of analysis for such phenomena.[2] Although the notion of "public demonstration" should sound familiar to most readers, the contours and stakes of my project here may not seem obvious at first sight. Indeed, the terms "demonstration" and "public demonstration" (i.e. demonstration conducted in public) are used in many social spaces. But the connections between the practices they refer to are not self-evident. Broadly speaking, it seems that a "demonstration" implies an audio-visual development whose main intended or declared purposes are proving, convincing or teaching, although its actual roles may be more diverse. For example, "demonstration" and "public demonstration" are commonly used to refer to experimental proofs or specific parts of physics lectures in the academic world, to performances of market pitchers, and to street protests. It is thus difficult to think of all demonstrative practices as belonging to one and the same field of inquiry.

Besides, these practices are often perceived as isolated or anecdotal events of social life, not worth extensive theorizing. The stakes of these practices are more visible only on specific occasions. Such was the case in the PowerPoint demonstration Colin Powell gave at the United Nations on February 5, 2003, in support of a war against Iraq. This also applies to

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[2] See also Rosental 2002, 2004, 2005, 2007, 2009.

demonstrations of certain home products on TV that have a major impact on sales. Public demonstrations have, in fact, major stakes in many domains, including economic life (e.g., as sales practices or tools for product design and launching), politics (as collective mobilizations or performances designed to test or persuade a large audience, for instance), and science and technology (as public proofs or teaching devices).

Here, I would like to reveal some of the sociological, anthropological and political stakes of demonstrative practices in general, and to highlight how these practices may be considered as part of a common domain of investigation despite their apparent diversity. So far, social scientists have contributed to studying demonstrative practices in a way that is often disconnected. A number of works, both in the history of science and technology and in scattered publications in sociology, anthropology and other social sciences, have explored different aspects of these phenomena in more or less depth. Several authors have illustrated the roles of public demonstrations as persuasion tools and rhetorical devices in various settings.[3] The nature of, and epistemological debates on, public demonstrations of technology have also been studied by a number of authors. In particular, the ways these demonstrations have been likened or opposed to geometrical proofs, to experiments, to lectures, or to displays of virtuosity, as well as their uses as spectacles and entertainment, have been documented across history.[4]

Several studies have focused on whether, and to what extent, public demonstrations are, or should be perceived as, fiction or reality. Some authors have portrayed demos as pure illusion or mutually agreed-upon fiction,[5] or as technological dramas that disable critical faculties.[6] Comparable to Tarde's portrayal of society as being composed of insane hypnotists followed by sleepwalkers,[7] certain public demonstrations have been described as performances of hypnotists influencing crowds.[8] Other studies have analyzed public demonstrations as multiply framed experience combining fabrication and reality.[9] In the framework of these approaches, audiences may have multiple or fluctuating experiences and may be at least partly aware of the fiction taking place in front of their eyes. In particular,

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[3] See, for instance, Latour 1983, Bloomfield and Vurdubakis 2002, Stark and Paravel 2008.
[4] See in particular Schaffer 1983, 1994; Shapin 1988, Collins 1988, Hankins and Silverman 1995, 37-71; Dolza and Verin 2003, Thébaud-Sorger 2009.
[5] See Wagner and Capucciati 1996, Lunenfeld 2000, 13-26.
[6] See Lampel 2001.
[7] See Tarde 1903.
[8] See Duval 1981.
[9] See, for example, Smith 2009.

using a dramaturgical metaphor, Goffman has depicted demonstrations as performances playing teaching or evidential roles.[10]

For the present day, scattered publications in the social sciences give an idea of some of the uses of public demonstrations in activities and domains of social life beyond the scientific field. These include business practices such as market pitching,[11] and product launching,[12] economic experiments,[13] architecture,[14] the film industry,[15] the health sector,[16] activities of hackers,[17] and forms of collective mobilizations and political participation.[18]

However, the material features, grammar and structure of public demonstrations appear to have attracted more attention than the interactions between demonstrators and their public or the actual effects of demonstrations on these audiences. Most studies look at demonstrations of final products, and far fewer at the uses of demos in the development of projects. More generally, it seems that many creative although barely visible uses of public demonstrations remain to be explored. The anthropological, sociological and political stakes of these practices clearly call for more systematic analyses. My aim here is precisely to contribute to such an effort.

The ACTS program was managed by the DG XIII[19] of the European Commission during 1994-1998; it was followed by other European programs: "Information Society Technologies" (1998-2006), and "Information and Communication Technologies" (2007-2013). Participants in the ACTS program included researchers, engineers and executives from various European countries, many of whom were working for telecommunication and computing firms.

My investigations of ACTS activities drew on several sources and combined different methods. By the end of the 1990s, I had conducted a series of interviews among ACTS participants in Europe, made some ethnographical observations of a large ACTS meeting in Brussels, and collected various types of textual and multimedia documents. These include a series of ACTS and independent reports, CD-ROMs and brochures produced by ACTS

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[10] See Goffman's definitions of demonstrations as "technical re-doings," "performances of a tasklike activity out of its usual functional context in order to allow someone who is not the performer to obtain a close picture of the doing of the activity," or as an "ideal running through of an activity for learning or evidential purposes," (Goffman 1974, 66-68).

[11] See Clark and Pinch 1992, 1995; Sherry 1998, Le Velly 2007.

[12] See Bloomfield and Vurdubakis 2002, Simakova 2010.

[13] See Callon and Muniesa 2007.

[14] See Houdart 2005, Yaneva 2009.

[15] See Grimaud 2005.

[16] See Winthereik, Johannsen and Strand 2008.

[17] See Auray 1997.

[18] See Brian 2001, Barry 2001, Girard and Stark 2007, Stark and Paravel 2008.

[19] Directorate General for Telecommunications, Information Market and Exploitation of Research.

participants and the ACTS program. The list of documents also includes electronic presentations of ACTS projects published on various European online databases, European newsletters and publications, newspaper articles, technical publications of ACTS participants, electronic exchanges of ACTS participants in a specialized forum, and video-clips of public demonstrations of technology.

Demonstrating in a competitive context

One of ACTS' main purposes was to help develop a very high-speed communication network in Europe in the image of the Internet 2 project in the USA.[20] More specifically, ACTS was intended to contribute to the development of a physical network ("James"), of multimedia applications and of telework experiments within major industrial firms and participating European institutions.

ACTS officials also had to "demonstrate" the achievements of their program to political and economic authorities and to the public.[21] Indeed, they routinely had to face questions and criticisms about the management of their colossal budget from both European Parliament members and various industrial lobbies.[22]

The process that led to the dismissal of the European Commission (EC) in 1999 illustrates the pressure that the European Parliament put on EC officials.[23] The dismissal was caused by a report charging the EC with fraud cases, bad management, and nepotism. This report was written at the request of the European Parliament.[24] EC officials also had to face contradictory demands of various lobbies such as the telecommunication operators' lobby ("ETNO").[25] As the plans for the EC fifth framework program were being finalized,[26] ETNO was publicly criticizing European Community funding of short-term commercial projects focusing on information society applications such as telemedicine, tele-education, electronic

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[20] On the role played by the European Commission in the development of electronic information services, see De Bruine 1994.

[21] On the work and views of European commissioners, see Joana and Smith 2000, 2002; Hooghe 1999, 2000.

[22] On the tensions of European governance, see Christiansen 1997.

[23] On the European Parliament's control over the European administration, see Chauchat 1989. On the history of the relationships between the Parliament and the Commission, see Schwed 1989. On the power of the European Parliament, see Tsebelis 1994.

[24] See MacMullen 1999, Georgakakis 2000, Meyer 2001.

[25] "ETNO" stands for "European Public Telecommunications Network Operators Association." On European lobbying, see Pirzio Ammassari 1998. On how large firms came to lobby in the European Union, see Coen 1997. On lobbying strategies in the EC and effects on professional groups, see Neale 1994.

[26] The fifth framework program took place from 1998 to 2002.

commerce, and multimedia content applications.[27] According to ETNO, such projects were already developed and tested outside different EC R&D programs. They duplicated private sector work and represented a waste of public European money. This position was said to be supported by an "independent" report headed by Etienne Davignon, a former EC Vice President for Research and Industry. ETNO was therefore lobbying heavily in order to channel the funds of the fifth framework program towards telecommunication infrastructures R&D, arguing that a modern telecommunication infrastructure needed to be implemented before developing applications.

ETNO was also facing other lobbies expressing divergent viewpoints. For example, Richard Sitruk, Director of ETIS[28] in Brussels, argued that funding application projects would stimulate the development of telecommunication infrastructures. ACTS officials had then to show that they adopted a relevant and balanced position between the funding of telecommunication operators and the subsidies of smaller firms developing multimedia applications,[29] and that each competing group and view was supported by the program in an effective way.[30] Showing the productivity of each aspect of the program helped to counter the claims of groups asking for a larger share of the subsidies on the basis of the supposed uselessness of competing projects.

In order to manage criticisms and forge a consensus, ACTS managers had to "demonstrate" the achievements of their program.[31] The emphasis put on "demonstration" as well as on Research and Technology Development (RTD) was explicit in the title of ACTS' third call for proposals: "Third call for proposals for RTD actions for the specific program for Research and Technology Development, including Demonstration, in the field of Advanced Communications Technologies and Services."

The term "demonstrate" had several meanings. One of its main meanings, according to the context of competition I have just described, was to exhibit technological accomplishments in order to convince audiences, or provide a proof, of the feasibility of technical projects. ACTS officials were careful to show results which could appear tangible and convincing both to economic and political authorities (such as European Parliament members), and to the public. To this end, they set up a material economy of visibility of possibly convincing results that requires analysis.

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[27] See Chappaz 1997.
[28] European Telecommunications Information Services.
[29] On the history of EC telecommunication policies, see Sandholtz 1993.
[30] On the importance given to competition in the European Union, see McGowan and Wilks 1995.
[31] On the complexity of European decision-making, see Rosenthal and Puchala 1978.

A large set of demonstrative tools

Several devices were used in the effort to show convincing results in the framework of the ACTS program. One of them consisted in the regular production and distribution of summary reports in Brussels and beyond. Such summary reports displayed many statistics on the projects, and used synoptic devices such as tables and figures.[32] They were more comprehensible for bureaucrats, industrialists and political authorities than many technical documents produced by ACTS projects. Besides, ACTS funded a large set of projects – around 150 – that produced masses of technical publications. These publications could not all be brought together on readers' desks, while ACTS summary reports could circulate quite easily.

ACTS summary reports contained detailed lists of, or figures on, registered patents, contributions to standards, and experiments and publications produced by, or attributed to, the ACTS program. They often included short presentations of ACTS projects. They also displayed statistics summarizing the results of surveys conducted among ACTS participants on the basis of questionnaires. These statistics showed the structure of experiments and technological applications designed by ACTS participants, as well as the projects' goals and program's "benefits" for the participants. For instance, here is how the program's benefits for the participants were presented in one of the program's reports. Figures were based on answers to a closed questionnaire. Only answers that were chosen by more than a quarter of ACTS participants were reported in the table:[33]

	Projects	%
Improved corporate image	62	45
Increased number of R&D employees	61	44
New business or research areas	55	40
Improved scientific reputation	52	37
Improved scientific performance	47	34
Increased contact research	43	31
Increased number of technical employees	36	26

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[32] On the use of European statistics and measurements by European officials to create a European consciousness, see Shore 1995.
[33] *ACTS, "Results, Impact and Exploitation," Interim Report* 1997: 20.

Such a table possessed notable assets to convince managers, members of the European administration and parliament, and various politicians, of the productivity of the program. The categories that were used here to assess the impact of the program fitted the language of business people concerned with marketing issues ("corporate image," "reputation"), employment ("number of employees"), market development ("new business areas," "contact research"), and performance in general ("scientific performance"). Unlike many scientific and technological descriptions of results, this vocabulary was also understandable to political authorities and non-specialist audiences.

ACTS officials relied also on other devices to demonstrate the productivity of the program, as well as to facilitate what they called the "dissemination of information." Electronic databases were built to display information on the projects on the Internet — especially well prepared abstracts. Journalists were hired in order to display exciting results to a large audience — especially in the framework of European publications.[34] Success stories of ACTS projects were also conveyed using different means of communication, including CD-ROMs.

For instance, a CD-ROM entitled "ACTS Multimedia Success Stories"[35] used a specific format to present selected ACTS projects as success stories. It described the nature of each "product," the aims and objectives of the project, the parties involved, the technological platform, the learning process, and the exploitation and success factors. Success was analyzed in four ways: internal factors, external factors, evidence of success, and reasons for success. For example, here are the evidence of, and reasons for, success that were invoked in the CD-ROM for a project entitled "Mira-III Teleradiology," a multimedia conferencing system that supports the viewing and manipulation of medical image data over networks:

> *Evidence of Success: The market is showing signs of interest. In October 1995, Telenor exhibited Mira-III at Telecom 95 in Geneva. This attracted about 120 serious applications from potential customers, although Telenor was not then in a position to sell the system because it was undergoing an internal reorganization. Current international contacts include a potential client in Ireland, a dealership in Australia, and interest from Middle Eastern countries.*

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[34] On communication politics in Europe, see also Meyer 2002, Requate and Schulze 2002. On showing practices of journalists, see Dayan 2009.

[35] *ACTS Multimedia Success Stories* 1996.

Reasons for Success: Mira-III is a good product, supported by scientific presentations at conferences visited by radiologists. It is important to demonstrate knowledge of the technology in a professional field.

This description illustrates ACTS officials' concern about producing "accessible" texts and, in particular, sufficiently short, well-calibrated documents. These documents were accompanied by images and videos to make the readers' task even easier. Using a common presentation format for all projects also helped suggest that ACTS managed all funded projects in a harmonious fashion. Besides, the above presentation highlights how presentations at conferences and demos were seen as generators of "success."

Demos

Running demos represented the most important way to demonstrate the achievements of the program. What does the term "demo" refer to in general?[36]

Demo is an abbreviation of demonstration, while in fact referring to one specific form of demonstration; "demonstration," by contrast, remains a generic term. A demo exhibits a technological device in action, such as some computer software. The exhibition frequently occurs in front of a selected audience, following a carefully elaborated scenario. A demonstrator may comment on the running of the technical device, perhaps linking its operation to general properties of a theory or methodology. Demos are commonly used by researchers, engineers, executives, sales representatives, and consultants in various fields to demonstrate the feasibility of a technological approach, the value of a specific theory, or the proper functioning of a prototype or product. The audience may include a mix of academics and representatives of economic and political power.

Generally, a *repertoire* (or stabilized narrative) is prepared in advance, prior to being deployed in the demo. This exercise is scripted in the sense that a scenario or script is used to organize the action,[37] but is not usually expressed in writing, or even orally, as is done in the movie industry.[38]

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[36] See Rosental 2007.

[37] On the embodiment of scripts in technological devices, see Akrich 1992.

[38] See Grimaud 2005. The development of the uses and contents of demos may be part of, and articulated with, the evolution of audio-visual practices and of the movie industry in particular, and especially of the nature of, and roles devoted to, trailers.

The preparation commonly takes a long time for demonstrators who are concerned to anticipate objections, doubts, and questions, and more generally, to control the possible interpretations and meanings associated with the presentation. Demonstrators may be also anxious to avoid computer crashes, and to distract attention from possible technical limitations, as well as to insist on achievements.

When a demonstrator is present during a demo, he tends to make himself a representative of the system (sometimes even a sales representative). Generally, a whole setting is created. Extreme, spectacular displays of the working of the device may be mounted to impress the audience. Members of the audience may be invited to exchange views or manipulate the device once the demonstrator has finished her personal performance. The outcome of the demo then depends very much on the demonstrator's ability to control the interaction. If this outcome is favorable, the positive impact of the demo can then be extended, as the witnesses can vouch for the reality of the achievements to a wider circle of actors.

The exhibition can be performed *in vivo*, but it may also be recorded and made into a video.[39] The audience and the demonstrator usually do not appear on the video, although the voice of the demonstrator may be retained. A video of the demo obviates the need to transport cumbersome, often fragile mechanisms when making presentations to sponsors or customers. It also allows the demonstrator to avoid the risk of failure involved in random replication of realtime demos.

ACTS demos consisted in particular in showing the workings and usefulness of multimedia applications and high-speed exchanges of information that facilitate various forms of telework. These demos gathered executives and managers of telecommunication and computing firms, engineers, researchers, EC senior officials, representatives of lobbying organizations, journalists, and politicians of various European countries.

Examples of demos for ACTS projects may be viewed on the Internet. This applies to Mira-III, mentioned above, and Isabel, a project focused on the development of tools for electronic meetings.[40] Indeed, some ACTS demos include the actual running of teleconferences.

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[39] Many videos of demos are available on the Internet. For example, one of Bill Gates' demos may be viewed here: http://www.youtube.com/watch?v=KqKC5A9JWTg

[40] See http://cordis.europa.eu/infowin/acts/analysys/products/thematic/multimed/document/mira/mira01.htm, ftp://ftp.cordis.europa.eu/pub/infowin/docs/visabel1.mov,
ftp://ftp.cordis.europa.eu/pub/infowin/docs/visabel2.mov
Last access July 8, 2013.

A teleconference called "21st Century: the Communications Age, a conference on the future of advanced communications," illustrates how such demos work.[41] Organized in Brussels on June 18, 1997, it was intended as a showcase for a number of projects funded by ACTS, including the high capacity network prototype "James." In particular, it was designed to show how ACTS accomplishments had made a high-resolution world teleconference possible. It was well covered by the media.

The conference gathered participants from various European countries, as well as from Japan and Canada. The list of speakers included the President of the European Parliament's Committee on Research, Technological Development and Energy, the then Portuguese Minister of Science and Technology, the co-founder and CEO of Netscape Communications, the Director General of DG XIII, and distinguished members of the Ministry of Posts and Telecommunications in Japan, the European Broadcasting Union, and BT. Telepresentations discussed policy and technological aspects of communications development and were intended to influence the development of future European Community policies and especially the preparation of the fifth framework program's activities in the field of communication technologies.

Demos of multimedia projects were thus combined with the exhibition of presentations, high-status presenters and high-quality images. Organizing a teleconference involving economic actors and political authorities was a powerful way for ACTS officials to demonstrate the projects' results to actors concerned with public spending policies. These actors did not need to assess ACTS results on the basis of experts' advice alone, nor of lengthy and weighty technical reports and papers, nor even of their own reading skills (an especially important asset for audiences that prefer moving pictures to texts).

The limited time needed to attend demos also offered a unique opportunity for busy economic and political authorities to grasp — or to believe they grasped — submitted projects. Such confidence is a precious asset in a world dependent on evaluation on the basis of limited time and know-how.[42] ACTS demos were thus crucial tools for various authorities both to assess the program and its projects and to make decisions on their future.[43] Altogether, they built a large "demonstration of strength"[44] of the ACTS program. Indeed, demos were not used simply to highlight the reliability of the technologies under development and of the participants. Their number also contributed to demonstrating the ACTS program's productive

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[41] See Geiger 1997.
[42] See Rosental 2008, 2010; Lamont 2009.
[43] On EC initiatives in evaluation, see Levy 1997.
[44] See Mukerji 2009.

power and its great capacity as a collective enterprise to create the conditions for technical progress.

Demos on clips and on lists

ACTS officials also used videoclips of selected demos to produce CD-ROMs advertising the program's achievements. Developed by researchers in communication sciences funded by ACTS to "disseminate" the program's results,[45] these CDs were distributed to ACTS participants, industrialists and political authorities. This represented a major way of creating wide access to ACTS demos for multiple audiences, spreading the visibility of the program and advertising its usefulness altogether.

ACTS representatives were eager to set up a mass production and distribution of demos. From the start of the program, they asked participants to run regular demos. Some of them were planned according to a four-year schedule. Demos on CDs were part of this grand scheme of production and distribution of demos.

The program also produced large numbers of reports on demos. For instance, some ACTS reports listed demos of ACTS projects and systematically described when, where and how they had been run. These reports enlarged the audience potentially reached by demos. Indeed, their circulation made the demos visible to actors who never left their office in Brussels.

For instance, one of the Interim ACTS reports, "Results, Impact and Exploitation," offers a detailed table of "Public Demonstrations" carried out by ACTS projects over a specific time period. Each demonstration is presented in sequence, and three columns provide information under the following headings: "Date" of the Public Demonstration, "Nature of Demonstration," "Target Audience and Reaction." For example, some of the public demonstrations carried out by a project called MIRAGE[46] are reported as follows:[47]

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[45] See also Brine 2000. On the mobilization of experts for the management of European programs, see Ant 1997.
[46] MIRAGE stands for "Manipulation of Images in Real-time for the Creation of Artificially Generated Environments."
[47] *ACTS, "Results, Impact and Exploitation." Interim Report* 1997: 40.

Date	Nature of Demonstration	Target Audience and Reaction
02. 09. 96	Showing of 'Eye to Eye' on dual display and sequential TV receiver to national press and technical journals.	Everybody most impressed with the demonstration. Result was a number of published articles.
12-16. 09. 96	Showing of `Eye to Eye', demo videos of virtual production, live demo of Virtual Edit Suite and character animation.	Most considered this the best 3 D TV demo they had seen. Much interest in the virtual studio systems and VES.
18-21. 09. 96	Showing of 'Eye to Eye' on large screen projection and sequential TV. Videos of MIRAGE virtual production and virtual characters.	Politicians, academics, broadcasters and manufacturers were highly impressed by the standards achieved and the practical systems demonstrated.

This table underscores both the breadth and diversity of the audiences of ACTS demos, and their extensive media coverage. It shows how frequently demos could be run – three times in one month in this case – and the spectacular settings the demonstrators sometimes created. It also illustrates how reactions were systematically screened and depicted so as to emphasize audience enthusiasm. Altogether, such a table reflects, but also contributes to, the demos "industry" that ACTS managers were helping to set up.

Demos at the crossroad between coordination and competition dynamics

As indicated above, the advance of ACTS projects was structured by periodical staging of demonstrations. In fact, ACTS participants often took advantage of the program's requirement to run demos on a regular basis according to their own diverse goals. Mounting demos allowed them to consolidate or create social links, for example by stimulating interest in their project among new actors, thereby helping to generate new contracts or new partnerships.

Demos not only helped participants to promote interest in their projects, but also to sustain confidence in their work. This, in turn, helped to justify the funding of their projects to administrative and political authorities, company managers and the public.

 Some demo versions allowed research engineers to show off their work to advantage within their firm. They also helped academics to gain credit in the eyes of their peers, or to find new industrial partners in various arenas. Different versions of demos could be combined

and reused in other frameworks and for other occasions. When planned to run in a number of strategic spaces, they became part of demonstrative campaigns. They were business as usual for ACTS participants, so much so that they became virtually *de rigueur.*

Running demos contributed to defining a project's content in a dialectical way. Indeed, engineers and researchers generally took seriously any criticism and suggestion expressed by the audience during a demo, and accordingly adjusted the orientations and reorientations of the projects. Systematic observation of audiences' reactions could even be used as tools for project management in defining the content of the research.

Demos helped ACTS participants coordinate actions with their audiences – peers, partners and customers – and with other participants. Indeed, the latter had to display collaborative work in the framework of the program in order to benefit from EC funding. ACTS demos were a perfect tool to exhibit, if not simulate, common achievements in this framework. In the competition among European telecommunication operators unleashed by the end of national monopolies, ACTS participants were often in a complicated position as regards collaborating with one another. As they had often competing approaches and interests, preparing common demos represented a least common denominator for them.

At meetings in Brussels, representatives of computing and telecommunication firms were concerned as to what could be said and shown, and what should not be revealed. They were often asked by their superiors to conceal certain aspects of their work under cover of technological black boxes. Demonstrators were negotiating these borderlines during demo interactions. Gaining information was generally more rewarding for the demonstrators than a well-kept secret, especially as it was generally difficult to trace the sources of information leaks. As a result, gifts and counter-gifts of information were very much in play. In such tense situations, demos might more closely resemble exchange tools than proof procedures.

Demos were also a point of reference in guiding decisions concerning the program's reorientations. As indicated above, ACTS gathered together actors with different (even conflicting) interests, who were supported by a variety of more or less influential lobbyists. In particular, EU officials had to arbitrate on European subsidies between major telecommunication operators developing a physical network, and small computing businesses developing software.[48] Demos were used as benchmarks in the corresponding negotiations, and therefore to consolidate or redefine the legitimacy of groups in the program.

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[48] On EC arbitration processes, see From 2002.

Public demonstrations as a bridge between science, technology and society

Altogether, demos played a central role in establishing and structuring relationships between a large number of actors. They structured the work of participants (especially when they were used as observatories of audience reaction, tools for project management, and exchange *apparatus*). They also structured the redistribution of credit allocated to individuals, teams and institutions, as well as to scientific and technological objects. Their impact was enhanced by a host of peripheral tools, such as written and oral reports, brochures, and CD-ROMS that presented success stories. Demos were the flagship of a fleet of demonstrative devices.

Consequently, various strategies permeated the use of demos and various other devices. The setting up and running of demos suited the complementary interests of several types of actors — scholars, engineers, firm executives, managers, politicians, journalists, administrative officers — and constituted a rare opportunity for interaction, competition, coordination of action, and building of partnerships.[49] Those actors would probably have never met without demos bringing them together.[50] The regulation of their exchanges was marked by recourse to spectacular demonstrations somewhat analogous to those that attracted the presence of scholars, entrepreneurs and representatives of political and religious powers in France and in England in the seventeenth century — although without the conventional courtesies that accompanied the latter.[51] At a global level, demos served as a privileged bridge between science, technology and society.

Public demonstrations as a constitutional topic

The process I have described allows us to understand why "demonstration activities" were at the heart of the chapter devoted to science and technology in the recent European constitution project.[52] In other words, it explains how demonstrations have become a constitutional topic in Europe. Indeed, the European constitution project indicates that:[53]

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[49] On the role of prototypes in aligning multiple and discontinuous social worlds, see also Trigg, Bødker and Grønbæk 1991; Suchman, Trigg and Blomberg 2002.

[50] For the effect of spatial arrangements on the administration of public affairs, see Domahidy and Gilsinan 1992.

[51] See Shapin and Schaffer 1985. For a typology of models of patronage across history, see Turner 1990.

[52] See *Treaty Establishing a Constitution for Europe* 2004, 109-111.

[53] *Ibid*. 109-110.

The Union shall carry out the following activities, complementing the activities carried out in the Member States: (a) implementation of research, technological development and demonstration programs, by promoting cooperation with and between undertakings, research centers and universities; (b) promotion of cooperation in the field of the Union's research, technological development and demonstration with third countries and international organizations; (c) dissemination and optimization of the results of activities in the Union's research, technological development and demonstration...

This statement illustrates how the elaborate knowhow in managing European R&D programs like ACTS based on the use of public demonstrations has contributed to shape the details of a political project at pan-European level. It helps in understanding how European politics and policies of science and technology have been defined in management terms in recent years, and how demonstration activities have become part of the toolbox of European public management.[54] Surprising as it may seem, demos have become key tools for European construction.

The many roles of demonstrations

The phenomena I have analyzed raise a major sociological issue. Should they be described in terms of the politics and culture of public demonstrations, whether at the level of the European Commission or at a larger level? In order to address this issue, we need first to ask what is meant by "demonstration," "politics," and "culture."

Various meanings have been attached to the term "demonstration" across different socio-historical spaces since Antiquity.[55] Generally speaking, it seems that a "demonstration" refers to an audiovisual development whose main intended or declared purposes are to prove, convince, or teach, although its actual roles may be more diverse. "Audiovisual" may refer to writings, such as the written proof of a mathematical theorem. It may also refer to live or videotaped demonstrations of technology. The intended or declared purposes may be exclusively to prove, convince, or teach, or may mix several of these goals. As in the case under study, demonstrations may simultaneously play less overt roles, and be used, for

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[54] On the evolution of the EC, see Dimitrakopoulos 2004.
[55] See in particular Serene 1982, Lloyd 1990, 1995; Jardine 1991, Hankins and Silverman 1995. 37-71; Lloyd 1996, Netz 1999, Chemla 2009, Rosental 2009.

example, as opportunities to make contact with other actors, as observatories of audience reaction, as ways to collect new ideas and build partnerships, as tools for project management, or as transactional devices.[56] Such roles should not simply be conceived in epistemological terms, as they may be of an anthropological, economic, and political nature, and a common object of inquiry for social scientists interested in knowledge production, markets, organizations, and politics.

We have been accustomed since Antiquity to view demonstrations in the limited terms of proof and persuasion, or *apodeixis* and *epideixis*.[57] However, the ontology of demonstrations cannot be reduced to proof and persuasion devices in general. Exploring the dimensions of demonstrations as spectacles is certainly valuable, but insufficient.

In particular, demonstrations cannot be understood *a priori* as one-way communication forms in general. As in the case under study, public demonstrations of technology may be used by researchers and engineers to communicate, but also *gain* information from members of an audience. The information gained may be used systematically by the demonstrators to shape the technologies and the corresponding theories periodically, to coordinate their action with others, to compete with them, to attempt to take control of the possible sponsors and customers, to co-construct the technologies and the users,[58] and to create a market around the emerging objects.

In addition, demos cannot be reduced to tools used to sell science and technology. Demos are not only run once scientific and technological contents are stabilized, in order to "sell" them, but may also be used at many stages to define the projects' contents in a dialectical way. Therefore, demos may be a key element in the processes that *bind* the making and marketing of science and technology.

In the case of ACTS, reports, CDs and live demos produced by the program were first of all intended to convince audiences of the program's productivity, of the feasibility of different technical approaches, and of the soundness of various claims. In some cases, they were intended to deliver a pedagogical message or serve as proofs for specific statements. Facts, figures, lists, arguments, success stories, videoclips and on-site demos combined

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[56] Similarly, it might be reductionist to describe the action of an individual buying her newspaper at the same shop every day simply in terms of monetary transaction: this ritual may have other functions, such as providing an opportunity for the buyer to exchange views with the shopkeeper, to create a social link, and to avoid loneliness. These functions may be as important for the buyer as the purchase of the newspaper *per se*.

[57] For insightful analyses of these concepts in ancient Greek science, see, in particular, Von Staden 1994, Cassin 2004.

[58] On this, see Woolgar 1991, Oudshoorn and Pinch 2005.

towards these goals. But they played other roles as well: they shaped interactions and helped manage an anthropological, economic, and political order.

We may therefore compare demonstrations to Marcel Mauss' total social facts,[59] and be sensitive to their effect on transactions, material and symbolic goods, and fate of groups. Preparing and running public demonstrations may mobilize or generate as many exchanges, resources, tensions, (re)distributions of alliances and intense moments of social life as, for example, the preparation and celebration of another grand anthropological event in many societies, the wedding.

Demonstrations also seem to be at the heart of a system one could call "scientific capitalism." I use this expression to denote the following dynamics: Demonstrations are used by demonstrators to obtain symbolic credit and various material resources. Demonstrators invest these resources to produce more demonstrations. In turn, these demonstrations are used by demonstrators to obtain further symbolic credit and resources. And so on. Demonstrations appear to play in scientific capitalism the role that commodities play in the Marxian theory of capital.[60]

Certainly, demonstrations may be perceived as "disinterested" by some of their producers. But there are unintended consequences of many postures such as "disinterestedness," including the creation of a large economic and political system like capitalism.[61] Thus, it seems relevant here to talk not only about demonstration, but also about the politics of demonstrations.

Demo-cracy

The EC appears to have developed a politics of public demonstrations if we use "politics" to refer to the regulation of public affairs within a given space, e.g., Aristotle's affairs of the City.[62] Indeed, EC representatives have employed public demonstrations as tools to regulate European Community affairs. They have used these demonstrations as methods and tactics to define and implement R&D policies. They have placed them at the heart of the art and science of running European affairs, and of making and enacting collective decisions in the field of science and technology.

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[59] See Mauss 1954.
[60] Note that demonstrations versus "inscriptions" (Latour 1993, 100-129) are at the heart of the economic cycles of scientific capitalism — "resources-demonstrations-resources."
[61] See Weber 2004, 2009; Shapin 2008.
[62] See Aristotle 1962.

Such phenomena are not unique. Indeed, various studies indicate that politics of public demonstrations have developed in other spaces and on various scales. For instance, NASA has deployed politics of demos at different organizational levels and used this to manage the relationships between the space agency and the public.[63] As public demonstrations appear to be widely employed in different units of social life, demo-cracies — regimes that use public demonstrations for the management of public affairs — seem to have developed on a large scale, and a large demo-cracy may have developed in the industrial world. Demos may be no less, or even more, important for collective mobilizations than mass media and street protests of social movements, especially as they can be widely seen via electronic networks. Public demonstrations are visibly important sources of contests and deliberation in the contemporary period.[64] In particular, antagonistic demos seem to play a large role in the competition for resources and in the political game.

According to Tocqueville, "the world is not led by long and learned demonstrations."[65] This claim seems to apply to demo-cracies, and especially to European demo-cracy. European Union affairs are not led by long and learned demonstrations, but to a large extent, by short and well-calibrated public demonstrations, and more particularly, by demos.

Demo-cracy does not appear to be identical to democracy. In the EU case, demo-cracy visibly benefits the masses, if only in providing them with specific forms of access to the closed world of laboratories and their technological production. But it gives less power to the ancient *demos* or people, as in an ideal democracy, than to skillful demonstrators and their institutions.

This is not to say that public demonstrations, and demos in particular, should be seen merely as all-powerful devices and tools allowing certain people to manipulate or mystify the masses.[66] Certainly, the resources of demonstrators and those of their audiences are often not equal, especially in terms of expertise.[67] But public demonstrations may fail to produce intended effects in some cases. They may be subject to variable interpretations, or be credited with different meanings, and produce mitigated and heterogeneous reactions.[68] A given demo may even be judged to have "failed" by some members of an audience, and to have "succeeded" by other members of the same audience. Besides, audiences are not a priori composed of credulous victims or enthusiastic idiots: spectators may remain skeptical and

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[63] See Rosental 2002.
[64] See also Callon 2003, Stark and Paravel 2008.
[65] Tocqueville 1981, 55.
[66] See Rosental 2009.
[67] See also Collins 1988.
[68] See also Rosental 2007.

keep their critical sense in relation to a demonstration. Also, as in the EC case, demonstrations may be confronted with counter-demonstrations.

Moreover, public demonstrations represent opportunities for various forms of participation, intervention and mobilization for actors who would be more removed from the management of public affairs otherwise. Such was the case for many ACTS participants. Public demonstrations help create spaces for politics aside from the main loci of political decisions, such as in the case of ACTS teleconferences.[69] Finally, there is no irrevocably fixed, stable divide between a group of demonstrators and a mass of non-demonstrators: demonstrators can take turns to a certain extent.

A culture of public demonstrations?

Analyzing the phenomena at stake in terms of culture is also useful here. If "culture" refers to cultivated behavior, based on the accumulated and socially transmitted experience of individuals and groups, it seems appropriate to talk about a culture of public demonstrations at the EC level. Indeed, using public demonstrations for the management of EC R&D programs corresponds to a knowhow that has been progressively tested, circulated, and cultivated to the point of being finally inscribed in the European constitution project.

Talking about a culture of public demonstrations at the EC level also appears legitimate if we use other partial and non-exclusive definitions of the term "culture." This appears to be true if "culture" refers to a set of practices, values, and norms which correspond to distinct and partially unified ways of communicating, and more generally, of acting; to "ruptures in any uniformities of practice" associated with "a certain richness of ongoing event" that may characterize the activity a given group;[70] and to "the entirety of intellectual preparedness or readiness for one particular way of seeing and acting and no other."[71] Indeed, by encouraging practices of public demonstrations, positively appraising some practices rather than others, and introducing formats and norms regarding the production of demonstrations, the EC has contributed to creating a relatively homogenous and distinct environment, rich in ongoing events, in which specific constraints and possibilities have

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[69] See also Barry 2001, Girard and Stark 2007, Lemieux 2009.
[70] See Knorr-Cetina 1999, 10.
[71] See Fleck 1979, 64. Ludwik Fleck uses this description in order to define his notion of "thought style."

emerged in terms of worldviews, communication, and action. This environment contributes in particular to defining what is possible or not for the participating individuals.[72]

However, it does not seem appropriate to reduce the phenomena at stake to those of a "scientific" culture. Indeed in the case under study, both scientists and non-scientists have participated in, and shaped, a common environment. Besides, some actors encountered in this *milieu* have such rich professional trajectories and identities that it is particularly difficult to label them "scientists" or "non-scientists." Using a general notion of culture as opposed to scientific culture helps us draw our attention to the ways scientific and non-scientific practices — especially demonstrative practices — have migrated, mutated, and articulated with one another at EC level.

In addition, talking about a culture of public demonstrations at the EC level does not exclude the existence of a culture of demos on a larger scale. Demos are not only used by participants in European R&D programs: Investigations I have conducted in Silicon Valley, at NASA, and in the field of artificial intelligence converge with various other studies[73] in showing that demos are used on a very large scale by engineers, scientists, consultants, marketing and sales executives in the industrial world, and that many similarities may be observed in terms of practices, norms, and values associated with their running. For example, some US engineers give more than hundred demos a year; Nicholas Negroponte, who created the Media Lab at MIT, rewrote the old adage, "publish or perish" as "demo or die"; and Guy Kawasaki's "official" title at Apple Computers was "software evangelist."[74]

A number of AI researchers I have encountered in Silicon Valley also value demos as ways to get in touch with peers and industrial partners, as opportunities to get feedback on their projects, or as tools for project management. They are no less constrained in using this form of demonstration in their working environment than were ACTS participants. Their comments on the working of technologies conform to narrative standards that can be compared with those developed by ACTS participants. As they place demos at the heart of their activity, they also appear closer to ACTS participants in terms of professional practices and identities than to other scientists who produce essentially written proofs — e.g. 'pure' mathematicians.

Certainly, large and in-depth investigations would be required to confirm the existence and define the exact geography of this culture of demos. However, a working assumption of

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[72] See Fox Keller 2004, 15.
[73] See my bibliographical discussion above.
[74] See Markoff 1996.

that kind already seems very useful for understanding why and how we have ended up living in a demo world.[75]

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