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Do Corporate Films Dream of Cybernetic Governance?

Computers (as Metaphors of) Industrial Labor and Society in Olivetti-Sponsored Films

Abstract
Addressing the audiovisual construction of computer labor, the essay focuses on the relationship between computers and film in their lifetimes as useful media. It analyzes the films sponsored by the leading Italian IT manufacturing company Olivetti between the late 1950s and the 1970s. Questioning Vinzenz Hediger's hypothesis on industrial cinema's inability to make computing visible, it argues that the cinematic representation of computers is invested with broader rhetorical functions and responds to a specific form of governmentality, inflected by the application of cybernetics in scientific management. Based on this premise, the essay is articulated in two sections. The first one, "Computer's Screen Debut," retraces Olivetti's early outbreak in the IT market and its concurrent participation to the Italian industry film festivals. At that time, company executives and film practitioners problematized how the new and still largely unknown machines could be (re)presented to persuade potential clients. The second section, "Envisioning Cybernetic Governance," analyzes Olivetti's computer-themed films. Through a comparison with those produced in the previous years, it maintains that company's corporate narrative and self-representation changed from a "pastoral" ideal of the factory as a community, to the cybernetic one of work organization as a socio-technical, data processing system. This shift enabled discursive analogies among computer, industrial labor and social organizations at large. The metaphorical tropes that re-occur across the considered film *corpus* are grouped into three categories to demonstrate how Olivetti's films turned computers into models of cybernetic governance.

Keywords
industrial cinema, sponsored films, Olivetti, computer, cybernetic governmentality

Introduction

Exterior day. A bunch of kids runs toward an electronic terminal placed in the middle of a meadow, that a later shot will reveal to be but a plateau above an industrial plant. The kids huddle around the machine, play with its keyboard, touch its screen, dance around it in a circle. One of them even sits on it, following the directions of an adult man who takes pictures with his camera. This is roughly what happens in the closing scene of *La macchina del tempo* (The Time Machine; 1969) a 15 minutes-long film directed by the documentary film-maker Antonello Branca[1] and sponsored by the Italian computer manufacturing company Olivetti to promote the release of TC100 electronic terminals.

If we were to follow the working hypothesis proposed by Vinzenz Hediger about computing in industrial cinema, the scene could easily be read as a meta-representation of the collision between photographic media and information technologies. Prevented from capturing the machine's inner workings, the man with the camera has no choice but to portray it in its outward appearances, as if it was a totemic object, thus symbolizing (photography's and) "film's inability to represent and perform what the computer does, its inherent limits of *Darstellung* [representation] in a cybernetic age."[2] Yet, even under this interpretation, some questions would be left unanswered: how does this dancing children scene fit in a corporate discourse? How is it supposed to illustrate the potentials of electronic computing devices primarily meant to be used in banks and shopping malls? If it belongs to a "utility film," what then is it useful for?

Fig. 1: A girl sitting on Olivetti's TC100 electronic terminal. Still from *La macchina del tempo* (Antonello Branca, 1968). (Archivio Nazionale Cinema Impresa — CSC; Archivio Storico Olivetti)

1) Not differently from other Italian filmakers between the 1960s and the 1970s, Branca was a left activist occasionally involved in the production of sponsored films. Before directing *La Macchina del tempo* he had co-founded the Filmaker Research Group and captured on camera the students' protests and countercultural artistic movement in the U.S. in the style of direct cinema — *What's Happening?* (1967), *California: il dissenso* (California: Dissension, 1968). One year later, in 1970 he will author *Seize the Time*, an inquiry film on the Black Panther Party.

2) Vinzenz Hediger, "Thermodynamic Kitsch: Computing in German Industrial Films, 1928/ 1963," in *Films that work: Industrial Film and the Productivity of Media*, eds. Vinzenz Hediger and Patrick Vonderau (Amsterdam: AUP, 2009), 143.

Analyzing and contextualizing the rhetorical strategies and the governmental logics in *La macchina del tempo* and other computer-themed industrial films is what this essay aims to do. With reference to specific context (Italy from the late 1950s to the early 1970s) and film *corpus* (Olivetti-sponsored films of the same period), it reflects upon the intertwining between the emerging technology of electronic digital computers and the already consolidated one of film in their lifetimes as useful media in business organizations. More specifically, it asks: how (and to what end) was computer labor represented in the films commissioned by IT corporations? How much (and to what end) did the computer as a representational object change the way industrial films worked and participated in a corporate discourse? To answer these questions, I will call for a different interpretative framework from the one proposed by Hediger. In the already mentioned chapter of the seminal collection *Films that Work*, he maintains that the transition from the thermodynamic to the cybernetic modes of production constituted an *empasse* to cinema's representational capacities. As opposed to the laborers' physical effort and bodily movements transforming energy into work, computer's storing and processing of data exceed the regime of visibility and knowledge that film, as an indexical medium, is inextricably tied to. Suddenly blind to the core information-transmission circuit, industrial cinema stubbornly kept on staging human labor by the "conventions of the thermodynamic age."[3] I argue that, whereas it is true that the capacity to capture the worker's bodily performance contributed to establish film as a management tool since the time of Taylor and Ford, this function alone does not exhaust the agency exerted by the medium in business organizations. As it has been now discussed by many, including Hediger himself, utility films fulfill broader governmental mandates, serving "as instruments in an ongoing struggle for aesthetic, social, and political capital."[4] In the present case, their usefulness is better understood in relation to a historically specific notion of governmentality we may define as "cybernetic."

The adjective here does not simply stand for a high-sounding synonym of "computer based." It indicates instead the epistemic frameworks and cultural logics underlying "a particular mode of scientific governance that emerged after World War II and that led to different outcomes in different contexts."[5] Originally introduced in the U.S. as a mathematical model for the study of organic and non-organic systems, by the second half of the twentieth century the cybernetic approach had been established also in Europe and become widely influential across a wide range of fields of knowledge and application, shifting from biology and engineering to social and human sciences. As Kline notices "in adopting the language and concepts of cybernetics and information theory, scientists turned the metaphor of information into the matter-of-fact description of what is pro-

3) Ibid.

4) Haidee Wasson and Charles Acland, "Utility and Cinema," in *Useful Cinema*, eds. Charles R. Acland and Haidee Wasson (Durham and London: Duke University Press, 2011), 3. The reference is meant as representative of a wider area of research that interprets utility films in light of Foucault's notion of "governmentality." Hediger and Vonderau themselves intended historical epistemology of media in industrial organizations as complementary to the approach of governmentality studies. See Vinzenz Hediger and Patrick Vonderau, "Introduction," in *Films that work*, eds. Hediger and Vonderau, 9–18.

5) Eglė Rindzevičiūtė, *The Power of Systems: How Policy Sciences Opened Up the Cold War World* (Ithaca and London: Cornell University Press, 2015).

cessed, stored, and retrieved in physical, biological, and social systems."[6] When conceptualized as multi-component, self-regulating systems that adapt to the external environment through information-feedback circuits, entities as diverse as animals, machines, factories, and social formations became virtually comparable — and equally manageable. In this respect, scholars Bernard Geoghegan and Zoë Druick reflected on the implications of a cybernetic approach underlying mid-50s human sciences on both sides of the Atlantic, demonstrating how audiovisual technologies were instrumental in both Palo Alto's psychoanalytic inquiries on American families and UNESCO's educational programs for European childhood.[7] In the present case, the emphasis is on how cybernetic principles were applied in the interrelated fields of informatics and industrial management, promoting a systemic, data-driven view of computers, of the work organizations producing them and of society at large.[8] As I will demonstrate, Olivetti's computer themed films do not only represent manufacturing processes — as it was customary in industrial "process films" already established during the thermodynamic age[9]. They also address wider (and apparently unrelated) governmental processes, such as managing social life in general and guiding school-educated kids toward a professional career. In the attempt to locate their "utility" from a governmental perspective, I will thus attend to how these films illustrated computers' *technical engineering* while performing *social engineering* tasks to their targeted audiences of employees and business insiders. To paraphrase the "three Rs" famously introduced by Hediger and Vonderau for the serial analysis of industrial films, my focus here will be less on what the medium (indexically) Recorded, and more on how it operated as a Rhetorical form and an agent of Rationalization[10].

Based on these premises, the article is articulated in two sections. The first one briefly introduces Olivetti as a sponsoring firm, locating its transition from mechanics to electronics along the *continuum* of computer history between the 1950s and the 1970s — that is from the advent of commercial computing through the development of mainframe and minicomputers[11]. Since it coincided with the heydays of Italian industrial cinema, the company's debut in the early IT market obtained wide film coverage. During this period a

6) Ronald R. Kline, *The Cybernetics Moment: Or Why We Call our Age the Information Age* (Baltimore: Johns Hopkins University Press, 2015), 6.

7) Bernard Dyonisius Geoghegan, "The Family as Machine: Film, Infrastructure, and Cybernetic Kinship in Suburban America," *The Grey Room*, no. 66 (2017), 70–101; Zoë Druick, "Operational Media: Cybernetics, Biopolitics and Postwar Education," *Foro de Educación* 18, no. 2 (2020), 63–81.

8) On the long-lasting influence of cybernetic governmentality on industrial management see: Felix Maschewski and Anna-Verena Nosthoff, "'Designing Freedom:' On (Post)Industrial Governmentality and Its Cybernetic Fundaments," *Digitalization in Industry: Between Domination and Emancipation*, eds. Uli Meyer, Simon Schaupp, and David Seibt (London: Palgrave MacMillan, 2019), 81–110.

9) As clarified by Salomé Aguilera Skvirsky, "processual representations" go way beyond the limits of a single genre or a historical era and "process film" is nor a synonym neither a sub-sector of industrial film. Nevertheless, it remains true that most of its early specimen of the process genre belong to 19th century useful cinema, as the author herself notes in *The Process Genre: Cinema and the Aesthetics of Labor* (Durham: Duke University Press, 2020), 52–55.

10) Vinzenz Hediger and Patrick Vonderau, "Record, Rhetoric, Rationalization: Industrial Organization and Film," in *Films that Work*, eds. Hediger and Vonderau, 35–50.

11) I'm referring to Paul E. Ceruzzi's periodization: *A History of Modern Computing* (Cambridge and London: The MIT Press, 2003).

series of documentaries were premiered in the specialized festivals, drawing the attention of professionals and commentators toward the development of Its and the potentials of their business-oriented applications.

The second section focuses on Olivetti-sponsored films as a body of analysis.[12] It relates both the company's transition to electronics and its newly adopted sociological theories of labor with a change in its corporate narrative and self-representation. It argues that the cybernetically inflected conception of work organization as a socio-technical, data-processing system enabled discursive analogies with other technical and social systems. Having to render these conceptual parallelisms in audiovisual terms, the films ended up by investing the computer with broad rhetorical functions, contributing to "the development and diffusion of human–computer metaphors in the middle decades of the twentieth century."[13] For analytical convenience, the metaphorical tropes that re-occur across the film *corpus* are grouped in three categories, establishing comparisons between computers' operations and, respectively, industrial labor, social living, and youth education. While formally presenting and promoting computers as the technologically advanced fruit of an equally advanced industrial production process, Olivetti-sponsored films advocate their use in virtually every area of social living. In so doing, they rhetorically turn computers into universal metaphors and models of cybernetic governance.

Computer's Screen Debut. Olivetti's Transition to Electronics in Industrial Cinema.

Computer historians usually date the dawn of commercial computing in Italy to the mid-1950s. In 1954 the only two running computers in the whole country were employed by research institutions — the Center for Numerical Computation at Milan Polytechnic University and the National Research Council in Rome[14]. In that same year, another academic institution, the Electronic Calculators Study Center of the University of Pisa, obtained national funds to build a computer from scratch, with locally produced hardware components. It was this latter project that raised entrepreneur Adriano Olivetti's attention[15]. Having inherited a long-running and internationally renowned typewriters manufacturing company from his father Camillo since 1933, he saw the transition from mechanics to electronics as a necessary step to renew the corporate mission and expand the market[16].

12) The nearly 3 000 films and videos belong to the Archivio Storico Olivetti are now preserved by the Archivio Nazionale Cinema Impresa in Ivrea, Turin. A large portion of the digitized audiovisual materials, including the ones considered in this essay, are now available for online consultation on the Archive's Youtube Channel: https://www.youtube.com/@cinemaimpresatv.

13) Seb Franklin, *Control: Digitality as Cultural Logic* (Cambridge and London: The MIT Press, 2015), xv.

14) Corrado Bonfanti, "Information Technology in Italy: The Origins and the Early Years (1954–1965)," in *Reflections on the History of Computing*, ed. Arthur Tatnall (Dordrecht, London, and New York: Springer, 2012), 320–321.

15) Giuseppe De Marco et al., "The Early Computers of Italy," *IEEE: Annals of the History of Computing* 21, no. 4 (1999), 32–34.

16) Erwin Daniels, Gianmario Verona, and Bernardino Provera, "Overcoming the Inertia of Organizational Competence: Olivetti's transition from Mechanical to Electronic Technology," *Industrial and Corporate Change* 27, no. 3 (2018), 600.

Therefore, the Italian manager provided the research center in Pisa with funds, personnel, and technological materials. His purposes, oriented toward the mass production and the commercialization of the new machines, eventually diverged from those of the university researchers. Already in 1955, this difference of interests led to the founding of a company-owned Electronic Research Division which, under the direction of Chinese-Italian electronics engineer Mario Tchou and laid the groundwork for the development of the ELEA 9000 series[17]. A fully-transistored model, ELEA 9003 was the first second-generation computer to be ever produced and marketed in Italy. It was launched in 1959 and later followed by ELEA 6000, a series of smaller mainframe computers intended for both scientific and business applications[18]. By the first half of the 1960s, 40 ELEA 9001 and 140 ELEA 6001 models were bought or leased, almost exclusively by Italian clients[19]. The demand in the domestic market was too low to absorb the costs of such an expensive production. Olivetti's original intent was in fact to export its new products globally and to enter a still emerging trade, at that time firmly dominated by IBM[20]. However, due to a series of unfortunate events, things did not go according to plan. After the untimely deaths of Adriano Olivetti and Mario Tchou between 1960 and 1961, Olivetti family had to face financial difficulties and was thus forced to sell 25% of its shares[21]. A pool of Italian top managers took control of the company and imposed the termination of massive investments in electronics. The Electronic Research Division was later ceased to General Electric[22]. The few electronic engineers who remained employed at Olivetti refocused their interests toward the less expensive area of light electronics: from 1962, a team supervised by engineer Pier Giorgio Perotto maintained a low profile while attempting to produce a computer comparable in size to a typewriter. The result of that research was first exhibited in 1964 during the Exposition of the Business Equipment Manufacturers Association in New York[23]. Programma 101, a transistor-based calculator capable of performing preprogrammed operations from magnetic strip, is often remembered as a predecessor of the personal computer because of its desktop size[24]. Its unexpected success helped to gradually revive interest in consumer electronics as a profitable business. By the end of the decade, with the fourth generation of (personal) computers approaching, electronics was on its way to become the dominant technology. However, for having divested its R&D department right before joining the international IT market, Olivetti had lagged behind its competitors and was never able to catch up. To this day, both computer historians and former employees unan-

17) Ibid.

18) Elisabetta Mori, "The Italian Computer: Italy's Olivetti was an Early Pioneer of Digital Computers and Transistors," *IEEE Spectrum* 56, no. 6 (2019), 40–47.

19) Michele Pacifico, "'Alta tecnologia e cultura millenaria:' Il contributo di Olivetti allo sviluppo dell'informatica in Italia," in *L'ospite ingrato: Centro studi Franco Fortini*, no. 6 (2021), 127.

20) See Elisabetta Mori, "Coping With the 'American Giants'," *IEEE: Annals of History of Computing* 41, no. 4 (2019), 83–96.

21) Marco Maffioletti, *L'impresa ideale tra fabbrica e comunità* (Ivrea and Rome: Fondazione Adriano Olivetti, 2016), 442–446.

22) Daniels, Verona, and Provera, "Overcoming the Inertia…", 603–604.

23) Ibid., 608.

24) De Marco et al., "The Early Computers of Italy," 34. Perotto himself, the leader of the engineering team behind the minicomputer, later claimed to have invented the personal computer: *Programma 101: L'invenzione del personal computer: una storia appassionante mai raccontata!* (Milan: Sperling & Krupfer, 1995).

imously recall the company's pioneering attempt as a "missed chance," blaming it alternately on the short-sightedness of the managers or on the lack of a national policy in support of technological innovation[25].

Despite its someway unfortunate outcome, Olivetti's outbreak into the IT sector allowed business insiders to take a glimpse on the way industrial labor and industrialized society would be transformed by the advent of the computers. The company's early venture in electronics coincided approximately with what Anna Maria Falchero recently called the Italian "golden age" of industrial documentary[26]. The late 1950s mark the inauguration of the Industrial and Artisan Film Festival in Monza, near Milan (1957) and the National Review of Industrial Film (1959), the latter organized by the main Italian association of manufacturing and service companies Confindustria. Equipped with its in-house film unit since the previous decade, Olivetti was among the first national enterprises to take part in these events with *film di prodotto* ("product films," presenting a specific product before its market launch), *film di relazioni umane* ("human relations film," aimed mostly at the internal audiences of employees) and *di relazioni pubbliche* or *di prestigio* ("public relations and prestige films," building the company's corporate image for external audiences)[27]. Olivetti film unit's productions were generally well received. Premiered at the Venice International Film Festival, *ELEA classe 9000* (1960), was a "high-profile" medium-length documentary illustrating the inner working of Olivetti's early mainframes, directed by Nelo Risi[28] featuring animated sequences by painter Gianni Polidori and cinematographer Giulio Gianini and with a soundtrack authored by avant-garde composer Luciano Berio[29]. Probably the first Italian non-fiction film to showcase a computer, *ELEA classe 9000* won the first National Review of Industrial Film. The same achievement was repeated six years later by another Olivetti film, *N/C: Il controllo Numerico* (N/C: Numerical Control; Aristide Bosio, 1966), featuring Angelo Gervasio's animated sequences, and the use of computerized machine tools to automate the manufacturing process. The already mentioned *La macchina del tempo* and *Le Regole del Gioco* (The Rules of the Game; Massimo Magrì, 1969) — an audiovisual introduction to Programma101's software[30] —

25) See Perotto, *Programma 101*; Lorenzo Soria, *Informatica: Un'occasione perduta* (Turin: Einaudi, 1979). American biographer Meryle Secret even followed a techno-political conspiracy trail as an explanation for Adriano's sudden death and the ultimate failure of its company: *The Mysterious Affair at Olivetti: IBM, the CIA, and the Cold War's Conspiracy to Shut Down the First Desktop Computer* (New York: Knopf, 2019).

26) Anna Maria Falchero, "Movie and Industry in Italy: The 'Golden Age' of Italian Industrial Documentary (1950– 1970)," in *Films that Work Harder: The Circulation of Industrial Film*, eds. Vinzenz Hediger, Florian Hoof, and Yvonne Zimmermann (Amsterdam: AUP, 2023), 635–650.

27) The contest promoted by Confindustria's National Review of Industrial Film was articulated in six different categories, depending on the subject and on the targeted audiences.

28) Younger brother of Dino Risi, one of the major directors in Italian-style comedy, Nelo Risi was a poet and a filmmaker who debuted as a collaborator of the ERC Paris Film Unit coordinated by John Ferno. Between the 1960s snd the 1970s he directed mostly sponsored films, TV documentaries and a few fiction feature-films such as *Diario di una schizofrenica* (Diary of a Schizophrenic Girl, 1968).

29) Alessandro Cecchi, "Creative Films for Creative Corporations: Music and Musicians in Experimental Italian Industrial Film," in *Films that work Harder*, eds. Hediger, Hoof, and Zimmermann, 779–797.

30) See Aa. Vv., *Cinema e Industria* (Milan: Franco Angeli, 1971), 191–219. For film data I make primary reference to Adriano Bellotto ed., *La memoria del futuro: Film d'arte, Film e Video Industriali Olivetti: 1949–1992* (Città di Castello: Fondazione Olivetti, 1994).

won respectively the ninth and the tenth edition of the festival. Critics who attended the events repeatedly praised Olivetti's film production for representing clearly the problems solved by computers and electronic elaborators "which are now about to enter our daily lives."[31)]

As new representational objects, computers and their business applications constituted a challenge for the sales and public relations department. A former manager of the Olivetti's Commercial Electronic Division, Michele Pacifico, recalls: "the computer was a mysterious machine, unknown to most, even to those who already had some experience with punch card equipment. Hence, not just salesmen but all the company's working *intellighentzia* was mobilized to introduce the commercial offer through explanatory documents and instruction manuals, with the aim of reassuring the skeptics and encouraging the eager ones."[32)] As a subsection of the Press and Advertising Department, also Olivetti's film unit had to persuade the potential clients that, with the new machines, "all of their companies' problems, not just the managerial ones but also the commercial and industrial ones, would find a modern, strong and definitely successful solution."[33)] Directors and writers seemed aware that their duties as "evangelizers" of a new technology could not be reduced to the task of mere documentation. In 1962, Aristide Bosio, a member of the Olivetti film unit and director of most of its titles, explained that "our documentaries are mostly aimed to be screened in the industrial circuits, to disclose all sectors of our production to our subsidiaries and buyers."[34)] Probably referring to *ELEA classe 9000*, he mentioned a recently produced "technical film" explaining that its aim was to illustrate "the functions of a big machine, very clearly, maybe even more clearly than showing the machine itself would do."[35)] A few years later, in an issue of *Film Special* magazine entirely devoted to "the world of electronics," critics and filmmakers would address the audiovisual

Fig. 2: Olivetti's film director Aristide Bosio on the cover of *Film Special* 2, no. 1 (1968). (Courtesy of Bibliomediateca Gromo — Archivio Museo Nazionale del Cinema)

31) Nedo Ivaldi, "Film industriali a Como," *Bianco e Nero* 30, no. 7–8 (1969), 124. All translations from Italian-speaking sources are the author's.
32) Pacifico, "'Alta tecnologia e cultura millenaria'," 124–125.
33) Ibid., 125.
34) Quoted in Walter Alberti, ed., *Il film industriale* (Milan: Figli della Provvidenza, 1962), 82.
35) Ibid.

representation of computer more directly, problematizing the difficulties in "grasping the essence of an activity that hides its great power under smooth, uniform surfaces or through the decorative fabric of its circuits; whereas, in the past, even the machine revealed its capacity and strength through the picturesque assembly of its parts and mechanisms." The magazine took the most recent Olivetti-sponsored films as examples for how they "visually 'attack' modern machines and stage them so that the audience can get a fair impression of their power […] not as 'objects' but almost as protagonists, living symbols of our technological age."[36)]

As I already discussed elsewhere, practitioners in the field of industrial and sponsored cinema were far from being mere executors or employees who have turned their hand into filmmaking[37)]. Their professional figures lied somewhere in between Frank Gilbreth and corporate consultants of early 20th century American industry[38)] and what we would call "brand and communication strategists" in the 21st century's informational economy. In 1960s Italy film writers and directors often came from a background in human sciences and were generally up to date about the recent theories in the newly established interdisciplinary field of Filmology. For uniting skills in audiovisual production with psychological, sociological, and educational knowledges, they usually had a firm grasp of the potentials of cinema as a means of social communication. Consequently, they were perfectly aware that "film is above all a language and, as such, can lend itself to being anything. […] Even when it aims to [represent] reality is, it does so as a means of expression, thus subjectivizing reality to the author's vision, decomposing and transforming it to fit efficiently the film's narrative structure."[39)] Computers had to be audiovisually and discursively constructed so to serve the sponsoring company's practical purposes, fit its corporate narrative, and enhance its views on the social relevance of information technologies.

Envisioning Cybernetic Governance. Computers as Metaphors.

To better understand how Olivetti's corporate narratives changed during its transition to electronics, we need to take a step back and get an idea at the early production of its film unit. Until the late 1950s, besides promoting new typewriters and calculators, sponsored films had been mostly focused on the welfare services the company offered to its employees and on how its activities had improved the living conditions of the communities living nearby the plants. Documentaries such as *Incontro con la Olivetti* (Meet Olivetti; Giorgio Ferroni 1950), *Infermeria di Fabbrica* (Factory's First Aid Room; Aristide Bosio 1951), *Una fabbrica e il suo ambiente* (A Factory and its Environment; Michele Gandin, 1957) or *Sud come Nord* (South like North; Nelo Risi, 1957) stand out for their attention to the social and human aspects of industrial work as well as for their critical stances on the risks

36) N.A., "Ritratti del mondo 'elettronico'," *Film Special* 2, no. 1 (1968), 9.

37) See Simone Dotto, "Istruzioni per l'uso: Teorie d'utilità nel dibattito sul film industriale italiano," *Cinema e Storia* 9, no. 1 (2022), 27–44.

38) See Florian Hoof in *Angels of Efficiency: A Media History of Consulting* (New York: Oxford University Press, 2020), 186–239.

39) Attilio Giovannini, "Il cinema tra realtà e linguaggio," *Film Special* 2, no. 1 (1968), 5.

of industrialization — a quite unusual trait for corporate films. By insisting on welfare policies and recreational activities and by drawing the attention to the social environment and rural landscapes surrounding the industrial plants, these shorts publicized the peculiarities for which Olivetti was (and still is) considered a model of "socially responsible" capitalism. They contributed in building its brand-reputation as a company providing health services, organizing cultural activities and taking care of its employees' physical and intellectual health also outside of the working hours. As Paola Bonifazio maintains "by subsuming the social into the economic realm, Olivetti films represented a society of government, in which politics becomes bio-politics." In this, the Italian firm's early corporate film propaganda adheres to the governmental rhetoric of "pastoral power," "in which business took an invisible role while the company's main concerns were devoted to the care of its flock."[40]

This corporate image was faithful to the progressive views of Adriano Olivetti, as an "enlightened capitalist." An early adopter of the scientific management of labor, he eventually became critical of Taylorism and a proud advocate of techno-humanism — a cooperation between techno-scientific and humanistic knowledge aimed at the improvement of working conditions. Willing to develop a "human-faced Taylorism"[41] and to emancipate workers from the obsessive, alienating routines of industrial production, the entrepreneur hired intellectuals, and exponents of the humanities among his collaborators. One of them, the future eminent labor sociologist Luciano Gallino, was assigned the task to investigate the reasons for the firm's impressive expansion in the post-war period. The research's practical purpose was to provide the company executives with a framework for interpreting (and enduring) a growth they had been witnessing daily but they still struggled to grasp. Through an approach indebted to William Hashby's cybernetics, Gallino described the work organization as "a complex socio-technical system, wherein a variable quantity of materials, energies (including many aspects of work) and information circulate uninterruptedly among its composing elements, each of which takes care of their processing, transformation and transmission in varying forms, with a view to the unitary purposes of the system."[42] The main features of the Olivetti model were identified in "the advent of new methods for the processing, employment and control of information" and in "the constant search for forms of administrative feed-back (by no means limited to the administrative sphere), designed to recompose the effective unity of command in the hands of management."[43] Rooted in the same techno-humanist premises, this characterization marks a shift from the "pastoral" ideal of the factory as a socio-economic community to a cybernetic one of the work organization as a self-regulating techno-social system.

The conceptual proximity between the organization of labor and the new technologies as "information processing systems" provided a striking analogy that industrial films' nar-

40) Paola Bonifazio, *Schooling in Modernity: The Politics of Sponsored Films in Postwar Italy* (Toronto, Buffalo, and London: University of Toronto Press, 2014), 85. See also Federico Pierotti, "Progettare il futuro: Il tecno-film Olivetti: politica, tecnologia e media," *Immagine* 39, no. 19 (2019), 129–152.

41) Luciano Gallino, *L'impresa responsabile: Un'intervista su Adriano Olivetti*, ed. Paolo Ceri (Turin: Edizioni di Comunità, 2001), 44.

42) Luciano Gallino, *Progresso tecnologico ed evoluzione organizzativa negli stabilimenti Olivetti* (Milan: Giuffrè, 1960), 11.

43) Ibid., 9.

ratives would take up and further extend. The following paragraphs will explain how, by analyzing the way films variously relate computer's operationality to different types of depicted "social systems," from industrial labor itself to the less obvious ones of social organization and school education.

Computer and/as Industrial Labor: a general analogy between the functioning of IT technologies and the organization of labor is featured in those Olivetti-sponsored films closer to industrial cinema's traditional structures and aims — showcasing either computer as an industrial product or its application for production purposes. Nelo Risi's *ELEA Classe 9000* does both, as it presents the new mainframe while retracing, step by step, the process of its fabrication. The different teams at work at the Electronic Research Division are introduced to the camera by engineer Mario Tchou in person and later shown to the viewer through several tracking shots: the camera lingers on the workshop that produces platelets and hardware memories, where "the visitor can still recognize traditional images of the factory," and moves on to show the logicians' team, whose organization resembles a university classroom. The differences between such highly specialized work-units stand out also on a visual level and it is up to the voice-over to emphasize the systemic coherence underlying the overall process: "the contributions of the various groups converge toward a single goal, the realization of the most functional system for calculating, processing and transmitting data." Following these words, a scheme of computer drawn by electronic engineers on a blackboard fades out and gets slowly replaced by Polidori and Gianini's animated sequences: here the operation of ELEA computers is illustrated with an essentialized depiction of data flowing through the machine. Live-action shots of Olivetti factory and animated sequences portraying computer's inner logics cooperate to present both ELEA mainframe and its fabrication as multi-faceted systems driven by the circulation of data. Information-processing serves as a common thread both for uniting the different work units and practical steps required by the production process (from hardware fabrication to software engineering) and for activating the various components of the brand new "electronic brain." Comparing the labor required to produce new machines and the way the same machines work per se is the pre-condition to present (and promote) ELEA 9000 as both a technological product and a tool for business managing. As made explicit again by the voice-over, the use of the computer "enables today the most rational and effective organization of the private and public enterprise […] allows the manager an overview, a look on the overall life of his organization that had been inconceivable so far."

The analogy between computer and work organization hints at a cybernetic reconfiguration of industrial production which is only implicitly suggested by *ELEA Classe 9000* and will be shown by later films in its practical consequences. When illustrating the use of "Auctor" computerized machine tools to automate the manufacturing process, Aristide Bosio's *N/C. Il controllo numerico* assume that a factory could be run exactly like a computer — that is by inscribing the instructions on a magnetic strip and transmitting them directly to the assembly line. The strip itself is shown as it runs from one spool to another in an animated sequence[44]: even more evidently than in the previous case, the function of

44) This frequent use of animation to explain how computers technically operate can be read as a confirmation to Hediger's argument on film's inability to referentially capture IT's labor. On a more historical note, it must

animation here is not only to cover for what could not be captured photographically but also to stress the crucial points in the film's rhetorical argument. The scenes showing a brick wall torn down by the strip may add nothing to the technical explanation on how the Auctor machine-tools actually work, but they aim to emphasize the time-saving potentials of a fully automated process. Throughout the film other rhetorical devices cooperate to emphasize the same ideal of automated immediacy. For instance, the concluding scenes feature a superimposition between the images of the engineers' spreadsheets on that of a machine running on the assembly line: "from design to implementation, the step is immediate," says the spoken comment, as to suggest that, when a factory is run by (and like) a computer, every product is already virtually manufactured as soon as it gets designed.

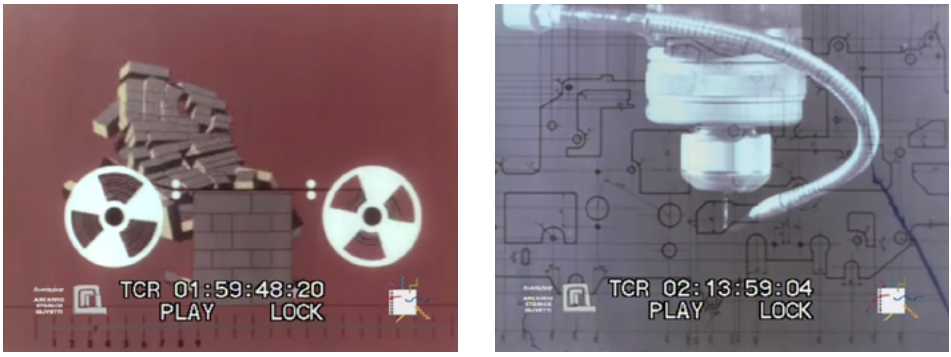

Fig. 3: Images of automated immediacy. Stills from *N/C. Controllo Numerico* (Aristide Bosio, 1966). (Archivio Nazionale Cinema Impresa — CSC; Archivio Storico Olivetti)

The superimposed image constitutes, in a sense, an over-elliptical account of the production process from which the process itself is paradoxically left out. In staging a computerized work-environment and the effect of automation over industrial production, Bosio's film approximates in many ways what scholar Salomé Aguilera Skvirsky famously described as the ultimate, aesthetic goal of the process genre: representing manufacturing processes as they approach the magic standard of zero-labor[45]. Differently from what would happen in a similarly structured film of the "thermodynamic age," there's no even need to minimize workers' tiring and alienating routine through — simply because there are no workers at the assembly line. Seeing computerized machine tools as they operate automatically create the impression that all the manual, repetitive work gets now done by

be noted that the inclusion of animated sequences was in no way an exclusive prerogative of computer-themed films: sponsored and industrial documentaries of the time often resorted to animated maps and graphs, as well as to cartoon characters, especially when illustrating a generally "abstract" social issue. In this sense, films like *ELEA Classe 9000* and *N/C* don't treat early informatics any differently from other sponsored documentaries and industrial films had done with subjects as, for instance, the job market or the farming cycle of an agricultural product. For an overview on animated documentary (and a focus the Italian case) see: Cristina Formenti, *The Classical Animated Documentary and its Contemporary Evolution* (New York and London: Bloomsbury, 2022).

45) Aguilera Skvirsky, *The Process Genre,* 116–117.

itself, without any human effort. *N/C*'s film portrait of the automated factory as a utopian work organization with no human labor doesn't only constitute as an updated version of the magic/technique dichotomy; it also epitomizes a purely cybernetic understanding of techno-social system as entities capable of regulating and adjusting by themselves — "automatically." The relative absence of human laborers in the film is, in this sense, significant. The mechanical workshops that were still visible in *ELEA Classe 9000* disappear, leaving us with only one worker portrayed at his desk. As the speaker suggests, "his time, busy but already somewhat free, can also be spent by doing crossword puzzles."

As if to prevent any possible objection about automation stealing humans' jobs, computer-themed films never fail to present the replacement of manual labor as a techno-humanist conquest. Electronics "is initiating man into a new condition of freedom and achievement. Subtracted from the most strenuous routine […] the person in charge of any technical, productive or scientific activity can now offer himself new, very broad perspectives." The films of the late 1960s promoting the Programma 101 minicomputers would stick to the same script. As stated in Magrì's *Le regole del gioco* "without human presence, men's current of thought and intellectual correction, the machines look abstractly and depressingly perfect, like abandoned instruments of the orchestra." The men in white coats standing before the mainframes and the female computer operators portrayed by these films are not merely "kitschy" reiterations of a thermodynamic human-machine aesthetics; they are instead functional in presenting the shift from manual labor to data processing as a necessary evolution from *homo faber* to (what cybernetics calls) *homo gubernator*: a new kind of worker enjoying an unprecedented intellectual freedom and entitled to participate in the control of production processes.

The Cybernetization of Society: to promote ELEA computers to layer audiences, Olivetti circulated an alternative version of *ELEA Classe 9000* renamed *La memoria del futuro* (The Memory of the Future; Nelo Risi, 1960). This shortened version edits out the sequences describing the computer's functioning while foregrounding its social applications. Car traffic and city life scenes are followed by sequences depicting a chaotic day at the stock exchange, the interiors of the library, an archive, an administrative office, a bank. What these seemingly unrelated places have in common is being complex social systems where "the need to rationalize the different services is becoming increasingly sensitive […] Only the thread of methodical discourse allows access to information, to knowledge which means human power." Having any direct mention of the computer preceded by an illustration of the problems it might solve is a rhetorical device which recurs throughout all Olivetti film production. Antonello Branca's *La macchina del tempo* showcases images of urban centers, schools, and department stores, wondering what our life would be like if it was possible to calculate in advance any future needs and possible change in social organization: "to predict, to plan, to build, one must above all know: for how many?"

In setting up different aspects of social living as logical and mathematical problems, Olivetti films adhere to a rule widely accepted in industrial and instructional cinema, according to which any portrayed object must be recognizable in generic terms, as "a kind of something."[46] With the possible exception of the sponsoring company itself (which will be

46) Ibid., 85–86.

referred to individually for obvious promotional reasons) characters, actions or situations featured in the films are presented generically enough to be immediately identifiable by anyone. In this sense, live-action and animated scenes not only cooperate in constructing the same abstract concept but also share the same status. Animation that, as shown in the previous paragraph, is often used to present the workings of the computer can serve as well to exemplify its application in a practical case, such as the management of purchases within the motor industry — as shown by the end of *ELEA Classe 9000*. Conversely, the footages of city traffic opening *La Memoria del Futuro* cease to be strictly referential when, as the speaker admits, they intend to depict a city "whose name doesn't matter because it is 'the city', the one where I live and the one where you live." For being based on a general, statistical abstraction of technical and social entities, both orders of images can be considered as "epistemic […], images that no longer simply represent, and refer to, reality, but become objects of knowledge in and of themselves."[47] In other words, photographic and animated images fulfill informative and illustrative tasks, enabling the viewer to understand the problem and eagerly wait for its solution.

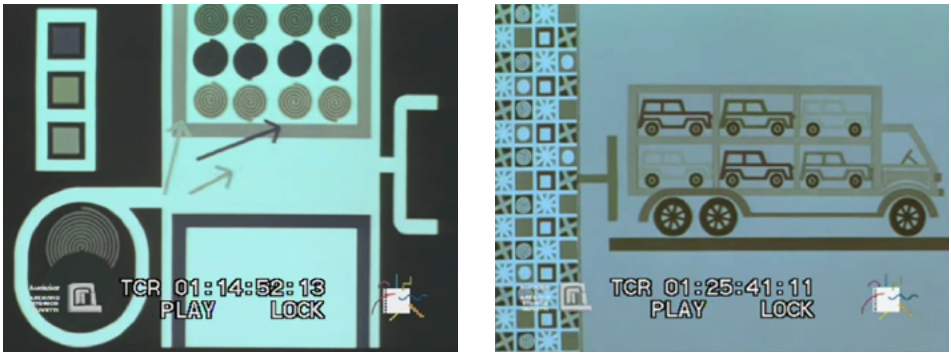

Fig. 4: Epistemic images. Stills from *ELEA Classe 9000* (Nelo Risi, 1960). (Archivio Nazionale Cinema Impresa — CSC; Archivio Storico Olivetti)

Computer appears here as a foregone conclusion, a much awaited (but still happy) ending. For being transfigured into an immanent solution, universally required by the very nature of everyday life, any further explanation of what it technically does becomes almost unnecessary. Particularly the mid-1960s titles hardly bother to explain the actual workings of the products they promote. In this respect, a borderline case is *Informazione Leitmotiv* (Information Leitmotiv; Renato Frascà, 1969), a 22-minutes long, entirely fictional short, starring the popular Italian actor and songwriter Enzo Jannacci. His character is a generic man, in a generic city, facing generic "modern life" situations. As soon as he arrives at a train station, he finds himself overwhelmed by signs, signals, banners, announcements; he tries to make a phone call but cannot read the numbers written in his notebook; he wants to get to an address, but the direction the passersby give him are confusing. Until a fascinating woman he had previously admired on a billboard appears as if in a dream, accompanies him down a silent corridor and promises to guide him through

47) Hediger, "Thermodynamic Kitsch," 146.

the labyrinths of information: "Information is what emerges from the mass of stimuli that burden the senses. Information is what matters, what allows to decide." Another six minutes elapse before Olivetti's IT products appear, on screen, only briefly and without further explanation. Instead of computer as a technical object, the film seems to promote *computing* as a techno-social skill. Information technologies are depicted as an (almost invisible) ordering principle within an entropic world, a rationalizing agency that would decrypt the secret codes of the "social system" and offer guidance through it. These examples might help explaining what the Olivetti company executives meant by saying that they needed convince potential customers that the computer would solve all their problems: of course, that could be done only insofar as all the said problems were (represented as) "computable." As that of industrial labor, the management of (information) society is essentialized as an issue of data quantification and processing within a multi-component, self-regulating system.

Programming the Future: Olivetti films are visually at their best when they dare envisioning an IT-dominated future. Stressing Programma 101's desktop sizes, *Le regole del gioco* closes by projecting the minicomputer in domestic situations: in the living room, in the kitchen, next to the bed or bathtub, indifferently operated by men, women and children: "It will be like making a phone call, like turning on the TV." Albeit openly declaring the playful (and nevertheless forward-looking) nature of these images, the speaker warns that "perhaps in a few years the irony will already be overcome by reality." The concluding sequence of *La macchina del tempo* mentioned in the introduction, the one with the children dancing around the terminal, acquire its meaning when seen under a future perspective. "The information machine […] for children growing up with new things is a simple, real object in a real time. Their own time, the time when everything has yet to happen." Elective affinities between new generations and new technologies will constitute the core subject of another film, *Un computer, dei ragazzi* (A Computer, Some Kids; Franco Taviani, 1969). The kids mentioned in the title are students in a middle school class in Milan: they receive the visit of an Olivetti employee who instructs them to Programma 101 and gathers their reactions. Franco Taviani captures the experiment in a sort of inquiry-film, with interviews with kids and teachers. In his notes, the director establishes an interesting comparison between old and new media, suggesting that the language of films represent

Fig. 5: Franco Taviani on the set of *Un calcolatore, dei ragazzi*. *Film Special* 3, no. 1 (1969). (Courtesy of Bibliomediateca Gromo — Archivio Museo Nazionale del Cinema)

to the school kinds "old and simple answers to already forgotten whys. Instead, they feel closer to binary mathematics, abstract symbology, and the range of possibilities of the computers, whose logics appear familiar and surprising at once."[48)]

This characterization of young people as "computer natives" is instrumental to represent the new technology within a long-term perspective, to naturalize its presence in the social context, and to humanize the threat of automation: "they say that machines will dominate humans […] but kids don't believe in these prophecies. They know that machines are not scary monsters but are made by men for men." Despite the alleged spontaneous character of this relationship, what the film effectively shows is a constantly supervised training process: school kids are instructed on how to use the computer to perform mathematical calculations, to organize a basketball matches and, in a self-reflective move, to select the most suitable options for the developing of film itself. More importantly, they use it to set the parameters for automatically calculating average grades. In discussing what percentage of sufficiency would be acceptable for each class, they are involved in the same decision-making processes that will eventually assess their school performances.

While exceeding the normal educational routines, these activities are part of a broader governmental project explicated to the viewers by the spoken comment:

> It is today that we must think and plan the future of these children and invent their future as adults; a satisfactory placement in work and society. […] The training of future programmers is one of the problems that must be addressed through a convergent effort; by the school, which must adapt its curricula and objectives, and by the industry, which must prepare the tools that would enable young people to have real experiences and be ready for future roles.

The term "programming" is here used in both a technical (instructing the computer) and a social sense (instructing students), as in two sides of the same design. As "black boxes plugged into cybernetic circuits,"[49)] students must be given the right inputs to become the workforce of tomorrow. In advocating their training as future programmers, the film and its sponsor also assume the students' position as programmable subjects.

Conclusions

The programming of the future suggested by *Un calcolatore, dei ragazzi* comes full circle with the other discursive strands on (automated) industrial labor and information society. If the computer is the overdetermined solution to an inherently entropic society, everyone should be familiarized with the managing of data flows since the youngest age. If work environments are increasingly based on processing and transmitting information in a feed-back circuit, then school kids must be trained to become technicians and knowledge workers. According to this logic, the use of computer is what enables students to partici-

48) Quoted in Bellotto, *La memoria del futuro*, 122.
49) Druick, "Operational Media," 65.

pate in the organization of school activities, workers to contribute to the control of production processes, and individuals to be active and aware members of the information society. The freedom promised by the computer coincides with the one specifically designed by a cybernetic governance, whose "domination operates precisely on the very basis of a participatory and collaborative environment."[50] (Future) workers and citizens are expected to emancipate and educate themselves so to adapt to a changing techno-social system and contribute to its functioning. Learning to govern social and productive processes is, after all, the precondition for keeping on being governed by them.

As it should be clear by now, none of these discursive functions could be fulfilled if film confined itself to recording computer's labor. Any more technically detailed account of the way computer work would probably be more explanatory of what the IT operator effectively does on a daily basis but deprived of the required rhetorical appeal. As governmental instruments crafted by specialized filmmakers, industrial documentaries resort to any disposable means in film language (photographic or animated images) to *make visible* a set of correlations that would otherwise stand only on an abstract level: how the "magic" of a fully automated production process would eventually free factory workers from the burden of physical labor; how any social and economic problem is inherently computable — and therefore solvable in advance with the computer; how even the future of new generations could be envisioned and programmed along technological progress. The audiovisual construction of computer labor is here consubstantial with those of its operators and of its social and organizational contexts: it does not simply *describe* but *prescribe* (and sometimes even *predict*) workers' and the consumers' activities, as well as the social relevance of technological product. Their goal is to make sense of human presence in a machine-driven organization, to convince workers of the advantages of a computer-engineered professional and social life, and to persuade external viewers into sharing the corporate views on technological progress. Given that the computer is turned into an almost universal metaphor, the lack of a detailed description of its workings turns out to be not only physiological but, to some extent, even strategic. As Franklin explains "the vagueness of the human-machine metaphor is central to [labor's] mobilization by capital:" as an integral part of a complex of technical processes and socio-economic logics, "vague metaphors allow for the constant expansion of processes of valorization as the subject is reconceptualized as both a communication system and a component in such a system."[51] In this sense the professionals at work at the Olivetti Film Unit — and in industrial cinema in general — contributed into giving audiovisual flesh to an otherwise deliberately "vague" cybernetic metaphor. The impact of this metaphor on Olivetti's corporate narratives become particularly evident when comparing computer-themed films with those produced before the electronic transition. Mentions of workfare policies and the factory as a community almost disappear, while critical stances toward industrialization are subsumed by the promise of a new technological age. Humanization and technologization of the work (and social) environment go hand in hand, both "crystallized" in the computer as the landmark of a new techno-social power.

50) Maschewski and Nosthoff, "'Designing Freedom,'" 83.
51) Franklin, *Control*, xxi-xxii.

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Biography

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