

# **Information and data processing in contemporary capitalism**

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## **I. INITIAL THESIS**

1. We start from a short text, published in 1989 by P. Boccara (*Issues*, n°34, 1989, p.97—101)]. The six major features of his definition of « information revolution » are the following:

2. —The actual information revolution, in process, would originate from the revolution generated by automation. It would be characterized by the replacement not only "of the hand handling the tool, but also of brain functions, or information revolution..." (p. 98)
3. —It would obviously cause to modify work
4. c) Information, the input and the principal result of this revolution, would be reproducible at a very weak marginal cost
5. —Information would have to be put out of the market. Instead of being sold and bought, it should be only shared
6. —The centre of gravity of the new processing society would move (of course, not automatically) from computers and machines towards people. From that impulse comes, for Boccara, the intention to create a new theoretical field : anthroponomy
7. —In the near future, investments in fixed assets would lose of their quantitative importance in macroeconomic regulation. The fight for a generous financing of workers training as well as a new regulation of labour market, would be the means of setting up the new society prepared by information revolution (IR). One will be able to find in the writings of other marxists a formulation of IR ideas rather close to that we have just summarized. For instance [Lojkine (1992); Dimicoli (2002), *La Pensée* (n°326, 2001)].

## **II. CRITIQUES CONCERNING THAT THEORY.**

8. These ideas have remained rather marginal among French marxist. However, it is true that data processing and computerisation are really upsetting human activities ans

introducing a revolution in capitalist society. But we can't neglect that sort of misunderstanding and we can't consider it as the simple effect of stupidity. It is possible, after all, that these ideas might be erroneous, incomplete, insufficient, and all that everybody can imagine to express its limits. What new elements of reflexion can be considered to start again the discussion about it ?

9. Here after, some critical arguments and remarks concerning these ideas can be found. They belong to a sort of « grey literature », due to the fact that they are going to be diffused during the preparation time of the French Communist Party Congress (texts written by Francis Velain, Louis Mazuy, Daniel Sanchez, though not focussed on the IR issue). All that is presented here in an extremely fast and diagrammatic way.

10. —The information revolution (IR) concept is considered not only as being the concept of a reality in process, but also, and mainly, as a partial concept of reality. It would neglect, for example, various scientific and technical fields of first importance such as biotechnologies, genetics, vacuum technologies (Velain). One could not thus take an exclusive support on the IR to deal with contemporary problems.

11. —The areas of IR applications have been mainly identified, at the moment, with scientific research, and, one could say, with heavy scientific research. Although this identification is likely to be a voluntary oversimplification, one cannot rely on it. For our part, we observe that the IR concerns:

12. —Companies : modifications of the organization of the companies (networks), their production process, their management process and their finance, deployed in a space more and more extended, settlement of *Intranet* systems, simulation process, modification in marketing with constitution of data bases and files customers, use of *Internet* (e—trade). Among the companies exists a class of companies, Banks and Insurances companies, which work massively on financial information.

13. —Administrations or organizations : constitution of multiple data bases and various files, computerized in the fields of social security, of pensions, unemployment, of police forces, integration of new methods of information and simulation in the fields of defense, development of meteorology, various cartographies, genetic information, medical files, teaching equipment, diffusion of various cultural objects, libraries, etc.

14. —Households, mainly their correspondence and their communications, as well as the use of Internet and of e—mail).

15. —Relations between these various agents, on a national and international scale.

16. Scientific research (public or private) is, thus, far from exhausting the IR phenomenon. One can't limit to that too much simplified approach with saying: « Information is reproducible at low cost. The modern solution is to exchange it by dividing it and not to sell it ». An assertion of this kind can be understood for the results of scientific research. But all information can't be analysed according to the model of the Thales or Pythagore theorem ( « worn out», to a certain extent) and some of them must be produced or reproduced permanently. There is a kind of necessary maintenance of information. Information is not « at low cost » anytime, once produced. In addition, the problems of sale, purchase, production costs of information are not the only problems raised by this specific input or product. There are information whose production is perhaps perfectly useless and abnormally expensive.

17. —A part of information seems indeed useless and socially expensive (for example financial information, or files made up to send advertising booklets). However the concept of IR can suggest that « all information » is useful and revolutionary.

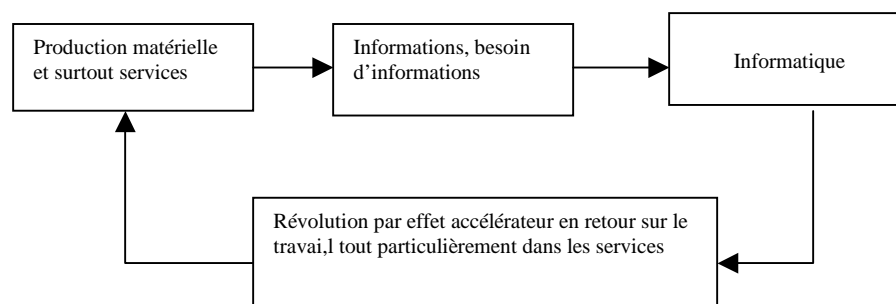
18. It seems that it is a different theoretical position which have to be taken into account. The existence of the IR should not lead to worship information and to consider it in a not—critical way [ Roszak (1994) ]. It is advisable to study, observe, analyze, classify, understand dynamically the contemporary diversity of information, their possible major coherence with the capitalist system, before being reduced to the « durable scientific information » that the people, the companies or the private individuals could divide and would have to share.

19. —Information is an input in human labor, and a result of this labor. As an input of the labor process, information, for some people, can be compared to a driving energy in this process. And, for Marx, a revolution is not defined by the energy which it uses but by the technical processes that it implies and more over by its way of reshaping human labor, the transformation of men relationships to nature requiring a parallel transformation of men relationships to themselves. Therefore, one could not say anything about information revolution, no more than one could not say anything about electricity revolution or vapor revolution. This argument (to which P. Boccara is certainly completely sensitive [ Boccara (1964) ]) was taken again by Lavallée and Nigoul [Lavallée and Nigoul (2002) ].

20. —Information is produced by activities we call « services ». To get a theory of the IR needs simultaneously to get a theory of the contemporary development of service activities [ Delaunay and Gadrey (1987) ].

21. —It is not enough to observe that IR is related to computers, dealing with operations usually made by human brain. We have to go further. Three remarks on that point.

22. —Initially, it is useful to analyze correctly the causes and logic of the society computerization, as well as the reasons for which information tends to occupy a dominating place there. There was not a leading movement of computerization so that the human brain functions would have been mechanically taken in charge in the human activities. There was a multiplication and a qualitatively new insertion of mental activities in the social activity, which made economically and intellectually necessary the setting up of a radically new family of machines (computers, of all sizes and all capacities, and their languages) able to process the data generated by these changes. While knowing how much the « dialectics of hen and egg » is one of the most difficult to deal with, it appears to us that services massively produced information (and the need for information) and generated in their turn data processing. Technologies of data processing are a consequence of these evolutions, but, once installed, they accelerate the movement of the whole and involve it in a true revolution.



23. —Machine tools also deal with operations of human brain. A person does not saw a board without using his (or her) brain during the cut. Consequently the argument according to which data—processing machines would deal with operations of the human brain whereas machine tools would replace only the hand must be, at least, refined.

24. —Finely, we have to consider the application points of these interventions. Computer can help to transform matter or to produce very new objects. Today, for example, one would not design a plane without computer. However, the structural and interindividual social relationships are, actually, the main intervention point of the computers. That is checked massively in banking and financial, or in commercial activity, in cultural activity. Concerning the social interindividual relationships, computer acts on the attributes of feelings (distance, voice, hearing, sight, image, sound, transfer of writing). With computers, there is a certain achievement of industrial revolution, but mainly the beginning of a new time of technical penetration of social relationships, which cannot be reduced or identify to the « pink telephones » phenomenon or with « chats ». According to our interpretation, the information revolution would mainly concern the vast sector of services and of social relationships. Everything being equal, we enter (it is an assumption that we will seek to check) a period characterized by a certain technical dualism : material production techniques on the one hand and social relationships techniques on the other hand.

25. —A last critique addressed to the concept of IR is that, due to its insufficiently worked out character, its technical (information, within the meaning of Shannon) and approximate connotation (results of research regarded as « information », as well as a customers file). The rough concept of IR would suggest that present world is composed of « atoms of information » which could be technically and universally modified or treated with computers. Socialism, parodying the well—known sentence of Lénine, could be defined as « computers + new social relationships.

—In short, the IR approach would be, in its actual current state of formulation:

—partial (other scientific developments that those centered on data processing),

—technician (insufficient taking into account of the transformations induced on labor),

—conceptually limited,

—should be located in the context of services development

—wrongly identified and reduced to research,

—unable to characterize any revolution of any kind, because of its nature of material input (information = energy).

—would not be perceived in its diversity and its totality (all information is not useful, existence of parasitic information).

26. To take these criticisms into account, it is necessary to wonder what is information.

### **III. WHAT IS INFORMATION?**

27. There is, on information, a huge economic, sociological and political literature [Arrow (2000)]. If one is only concerned by the definition of economic information, it seems that we can locate at least 5 keys of classification and start to answer to the question

## **1. BY THE PHYSICAL CHARACTERISTICS OF INFORMATION.**

28. Information is then studied according to its duration, the methods of its production, of its reproduction, its appropriability, the forms of its « consumption ». Being identified with a good, the question then raised is mainly to know if it can be privately owned or if it is a collective good, and which must be the economic appropriate statute for it. In complement of this interrogation, of course that of the rights of ownership on information [ Boyle (2001) is raised ]. Intellectual property rights is one of the very active fields of social research in economy. Other questions connected : how to sell, buy, develop information and, consequently, knowledge (knowledge economy) [ Neef (1998) ] ?

## **2. BY THE USERS OF INFORMATION**

29. Economic agents do not use the same kinds of information. Companies, for instance, use internal information to manage their production process, more and more spatially spread out. They gather in networks to save capital. They have got files of customers. Largest of them have management software (for example SAP). The administrations, on their side, are in the center of a modern system of information resulting from the development of Welfare state and the extension of its economic functions, taxes, social, cultural, medical, police, military spendings, espionage, control and general social operations. The households are also users and producers of particular information (mail, etc). There are interfaces of information between these various agents.

## **3. BY THE TYPE OF INFORMATION OPERATIONS CARRIED OUT (TECHNICAL APPROACH)**

30. Transfer, collection, maintenance, storage, enrichment, development, accumulation, etc.

## **4. BY THE POWER IT CONFERS**

31. Asymmetrical Informations theory, theories of the moral hazard, agency, theory of incentives, of contracts, power on the market, economic and political power of the companies and the dominant nations among themselves, etc.

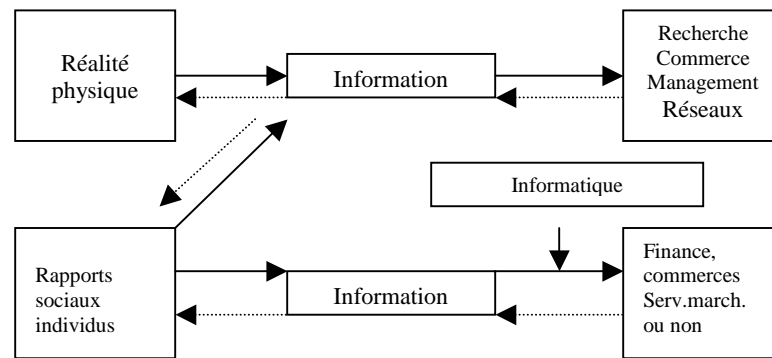
## **5. BY ITS FINALITIES AND ITS METHODS THE INFORMATION FOR WHICH? INFORMATION HOW?**

32. One could lengthen this list. Each theory develops its particular approach about information, and each point of view can be an opportunity to classify information in a certain way [ Petit (1998) ]. Concerning the theory of Marx, for which it is very significant to understand phenomena in comparison with totality in which they are (and not in an analytical and isolated way) and to understand how they are connected with labor, it seems to us that information (economic) must be defined relative to the place it occupies and to the role it holds in the process of production of the companies and of the whole economy. In accordance with this orientation, one retains the two following aspects of information in the contemporary society:

33. information is a double of « reality ». It is at the same time a sign of reality and a significance for those which receive and interpret this sign.

34. For various reasons, the developed contemporary capitalist society (which is, by structure, a dual society [value and use value ]) would work more and more on the double of itself. Upstream, on its double (scientific work) and downstream, on its social double (its

structure, its social relations). What would particularize our time and would distinguish it from the preceding ones, under the information point of view, would therefore be connected with the following phenomena : 1) the information and the need for information (in particular the economic information) would have been multiplied in considerable proportions, for reasons which one does not evoke here; 2) More and more activities, market or not, would be explicitly devoted to a segment of this double of physical and social reality. Work would be, like it is used to sying, less and less « material » (it would act, in fact, on the basis of an other materiality) and more and more « distant » from matter, in the traditional and very elementary meaning of the term; 3) This work on « the double » would have been penetrated by machines of a new type (in particular of the computers) and by specific procedures (software and intellectual architectures of all kinds); 4) It would be possible, today, in an extremely powerful way, to work and act on « material » reality by the intermediary of an intervention on its double (virtualisation); 5) It would be also possible to act directly, and thanks to this new equipment, on these doubles of reality which are the structural relationships and the social interindividual relations. What can be visualized by the diagram below:



35. Comment: At the time of « information society » (which is also service society, knowledge society, finance society, the society of exacerbated competition), labor on information replaces or accompanies in new proportions labor (simulation, space conquest, software of management of companies, exchange of information between companies, exploration of the market, use of computers in financial globalisation, medical investigations, files, etc). The two levels of the graph distinguish 1) companies of traditional production (which integrate information revolution to produce differently, on the one hand, and to act on social relationships or the social interindividual relations on the other hand (for example, development of e—trade, of call centers, computerized management); 2) service firms of all kinds (market and non—market sectors) to which communication and information technologies bring a capacity and a huge power of intervention, to intervene on the fundamental social relations between economic actors, groups, institutions, individuals, with a very new scale of power.

#### IV. WHAT QUESTIONS CAN BE ANSWERED, STARTING FROM THIS APPROACH?

36. From this approach, we note 8 questions (or problems), to which answers or brief replies were already brought in certain cases. But by pushing back out of this paper the level of this operational level, we simply seek to present these questions very shortly.

—Weight of the information revolution.

37. Even if it exists today other forms of technical changes than IR, we consider that IR is of primary importance as it undoubtedly relates to the material production, but also, directly and massively, to the social relationships. What it seems to us so important is that the IR does not modify only the workers to nature relations. It also modifies (and according to us especially) the workers to society relations. A double approach, is to be carried out. To one side, IR produces a mass, collective and powerful effect (something « infinitely large ») and to the other side, IR produces an individualization effect (something « infinitely small ») and raises the necessity of collective and individual responsibility.

—Modifications of the use value characteristics of labor.

38. It would be very convenient to theorize, on a concrete basis (on the base of the observation and not by handling only concepts), the modifications induced in and on labor by the IR. We already noted some features in this text (for example increasing distance with matter, possible distension of work units, etc.). It would be important, according to us, to study precisely these use value changes in all the spheres of activity of the social life, and not only in traditional industries.

—Modifications of the capitalist value characteristics of work.

39. Item 3 would consist in studying, in parallel of the preceding point, the way in which capitalist system manages and organizes this evolution of labour force, how the exploitation process of paid work evolves, and according to which methods.

—IR and social classes.

40. Item 4 would be devoted to the study of social classes corresponding to these changes. Is the IH it at the origin of « new social classes »? Is the IR a dimension reshaping the skills of all workers and employees, or is it generating a particular category of employees? This interrogation can take the following form : « Does the IR modify the whole of the skills and crafts or is it at the origin of new skills and crafts » ? In this connection, we think of the idea developed by R. Reich (an ideologist of the Clinton time) for which would exist today two main categories of employees, the symbol workers, having global economic and intellectual horizons, and the « matter » workers, captive of their intellectual and territorial limits, but which would be already overcome and rejected by the historical movement [Reich (1993)]. Although this Reich' book is vulgarly ideological, perhaps one should not neglect the possible share of truth it contains. Instead of opposing these two kinds of people, like this author does, how to connect their interests.

—IR and power:

41. It seems that the IR renews phenomena of power and the exploitation capacity of capitalism. We distinguish, on that issue, power *on* information (via the information infrastructures) from power *by* information (via the capacity exerted by the large media). The checking of the permanence of fundamental social relationships of exploitation

(privative appropriation of value created by others) and of domination, in spite of the private property dematerialization, is obviously located at the heart of this examination. However, it is necessary to examine the contrary processes and the possibilities offered by the IR (but with which conditions?) of fight against the exploitation, domination and oppression [*cf.* CyberMarx].

—IR and inequalities between social groups and nations.

42. It is banal to hear that IR supports globalization of the savings and of all kinds exchanges. Indeed, this process of globalization is accompanied by the reinforcement of the power of certain nations and countries (or groups of nations), of social groups. The process of formation of the inequalities is simple to observe and analyze, although it did not receive satisfactory total treatment yet.

—Financial information:

43. It is certainly an immediate need to put an end to the free movement of « financial information » for the exclusive benefit of powerful, to their potentially anarchistic multiplication and unequally distributed, to the disordered and arbitrary process of their creation. In the whole of the structuring informational activities of the contemporary world, that sort of information must be put under supervision. It is confirmed, day by day, that underdevelopment is definitely not fought by freedom financial capital, contrary to the theory of efficient financial markets. Bonds, and currencies are information whose computerization increased, in a frightening way, the power of displacement and volatility. The foreseeable development of the electronic money is also to consider with a great attention [Aglietta and Orléan (2002)]. This wild power must be, it is the minimum, controlled by democratic institutions to define principles to make prevail.

—Labour productivity in the context of IR.

44. It is well—known that, for Marx, the development of intellectual powers of the capitalistic production was to cause the capitalist mode of production become completely ineffective. Indeed, the more the labour productivity increases, the less there is living value in the market products. When the labour productivity becomes infinite, the source of the valorization of the capital (alive work) disappears. The more this mode of production intellectualizes and, according to its own slope, materializes the intelligence in increasingly powerful machines, and the less it is profitable and viable. The paradox of our time, where one observes intellectualization of production process (knowledge society) and the multiplication of computers and other hyperproductives machines, is that it is accompanied by the very significant deceleration of labour productivity (and of capital). Its recent increase in the United States is discussed. It is, in any event, modest even if it is higher than that observed in other european developed countries. It seems to us, in any case, that the thesis drawn from *Gründrisse* (Marx) must be considered carefully. The society generated by the IR can certainly put the capitalist system of production the valorization of the capital, but may be for on other bases and for other theoretical reasons that those outlined by Marx.

—Information, goods and capital.

45. According to that short text, a last point of the research program to be undertaken on IR, from a marxist point of view, relates to the adequacy of information and the goods and capital forms. It should be recognized that this theoretical field is exploited still little.



Characterization of the goods information as being potentially not—marketable because reproducible, is one of the possibilities of approach. This way of theorization is not new and, at our knowledge, was presented in the economic literature good before Marxists seize it. Many problems remain : for example that of the services theorization [Delaunay (2001)].

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