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Cognitive Capitalism and Entrepreneurship

Decline in industrial entrepreneurship and the rising of collective intelligence

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Abstract : Entrepreneurship has always constituted a weak point in classic and neo-classic standard economics. Nevertheless, its main characteristics were progressively introduced in the economic analysis. Some essential staples of this acquisition, as well as the essential characteristics of “entrepreneurship” are briefly summed up from the captain of industry, to the creative manager of giant firms, from the “diffused fabric” of “the second industrial divide” to the Net Generation start-uppers. The paper examines how the shift to a third capitalism, what we call cognitive capitalism relying upon capture of positives externalities more and more produced, located, and acting *outside* the historical boundaries of the firm, for *continuous innovation* and *production of different publics (audience) more than market of commodities*, is modifying radically the nature of entrepreneurship. New models are emerging. To what extent these new post-industrial divides will become hegemonic new business models or remain marginal depend broadly on their relationship with the markets, State, property rights, new commons, ethical, civic and political values.

In this sense, the question of entrepreneurship in the digital era involves not only organizational (firm, cities, territories), institutional (regulation of class relations, work and employment issues) but the very constitutional questions of the crisis of the wage system of employment, the nature of a post-Beverigdean system of Welfare, the emergence of a post-Smithian division of labor and new approach of competencies, the shaping or horizontal authority and the role of collective intelligence in producing value. The lens of the “entrepreneurship” question lead us back to a plausible revival of a new political economy.

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1. Firm, Entrepreneurship, innovation, Achilles's heel of the standard economics.

Innovation and its actors have represented a weak point of neo-classic political economy since the political economy abandoned the ambition to link a theory of a social class with economic growth, unsteadiness and social change like Smith, Ricardo, Saint-Simon and Marx² had purported to do so. "Entrepreneurship" had represented probably the way to allude to a "social class" as the key of the social change on the road of capitalist industrialization, since the word "captain of industry" has been already used during the mercantilist era and the terms of "bourgeoisie" or "capitalist" stamped by Marx and the working class movement to refer to a much broader aggregate of owners, rent seekers, parasites classes as well as of Weberian industrious men of the ruling class³. But, as William J. Baumol has noticed, "*the theoretical firm is entrepreneurless – the Prince of Denmark has been expunged from the discussion of Hamlet*"⁴. The more entrepreneurship was at stake and has occupied the narrative of true capitalism "*en chair et en os*" (flesh and bones), the less it has shown up in the analytical discourse of political economy⁵.

In a perspective of economical equilibrium, methodological individualism (the *homo oeconomicus*) and decreasing returns, any exceptional behave, any collective interaction, any institution and/or organization which does not fulfill the requirements and the rules of the market, will lead to under optimal situations and, hence, should be avoided⁶. It is exactly what Harvey Leibenstein has expressed in the following vigorous terms : "*the standard competitive model hides the vital function of the entrepreneur*".⁷ A. Marshall, worrying a little more than L. Walras⁸ about the real world of the economy, invented the *representative firm* within a sector of an industry and thus introduced the fundamental concept of external

² A. Giddens (1973) chap. 1.

³ R. Bendix (1963 pp. 22-23) used the term "entrepreneurial class" for its function rather than for "the social composition of the pioneers of industrialization".

⁴ W. J. Baumol, (1968), AER, p. 66.

⁵ For an accurate state of the art see R. Swedberg (2000) and M. Blaug's article (1986) .

⁶ "*Obviously, the entrepreneur has been read out of the model. There is no room for enterprise or initiative*" (W. J. Baumol, Ibidem, p. 67).

⁷ H. Leibenstein, (1968), p. 72.

⁸ Leon Walras sees the entrepreneur as a pure intermediary between capital as financial assets and labor as skills.

economies to avoid the abstractness of a theory of enterprise that have no real consistency vis-à-vis the market. External economies are present in the *Principles of Economics* with their technological and geographical effects on the economies of scales to explain growth. But it is later, in *Industry and Trade* that he used external economies to go beyond the limit of the firm or any given branch of industries : « *The economies of production on a large scale can seldom be allocated exactly to any one industry : they are in great measure attached to groups, often large groups of correlated industries* »⁹.

However, even for Marshall as for J. S. Mill, the entrepreneur is but a manager of production, hence of inputs and technological conditions. Business men, innovators, become *in se* and *per se* weird creatures as soon as they depart from the famous by trial and error process. If I. Kirzner (1973) was able to find a “niche” for entrepreneur and entrepreneurship in the neo-classical theory, it was only as accelerators or speeders of a return to equilibrium after an exogenous shock¹⁰. It is not by chance that most of the theory of entrepreneurship was to spring *outside* of the main stream from unorthodox economists deeply influenced by the historical school and soon after, by the Winsconsin school : Max Weber, Joseph A. Schumpeter, Frank H. Knight, T. Veblen. It is not by chance either, that contributions of another set of outsiders like Ronald Coase, Herbert Simon were incorporated only in the main stream, in the late 1980, when they were granted the Prize in Memory of Alfred Nobel. By these times, the Fordist regime (what Veblen would have certainly called “the machine process”¹¹) was already exhausted¹² and the Keynesian and Beveridgean regulations principles were slowing and suffering severe and victorious attacks from the neo-liberal counter-revolution. Whereas also, I should add, the secession of Management and Business schools from the departments of Economics had become as sure a fact than, seventy years before, economy as a discipline had divorced from descriptive Statistics and Law. But in the same time, as the basket is never full, never empty, the Digital Revolution or Information or INT (Information New Technologies) had turned the Industrial Revolution of the 1780-1870 into an almost pre-historical matter. To such an extent that Management science who had boasted to “awake economy from its dogmatic sleep” (so to adapt Kant) is now threatened in most of its rules (in management of innovation, finance, marketing, boundaries of the firm, property rights,

⁹ A. Marshall (1919), p. 18.

¹⁰ I. Kirzner (1973) *Competition and Entrepreneurship*, Chicago, University of Chicago Press.

¹¹ See chapter 2 of Veblen's *Theory of business enterprise* (1904).

¹² The reasons why the Fordism was exhausted are an inextricable mixture of changes in technology, qualification and education of the working force and growing social unrest and problems of discipline. The best example of the link between the intensity of social movements and the crisis of the discipline among unskilled workers is provided by the Italian *Operaist* school of Marxism. See my *Introduction* to A. Negri (1989).

integration of fundamental science, human resources and strategic management) just like the monopolies and cartels Era (1880-1930) had gently but firmly swept aside the neo-classic representative firm, and separated ownership from management¹³. Even if the separation of manager and ownership in the juridical status of corporations (the major innovation after the invention of stock actions societies) was to blur another, but altogether important, distinction between the *entrepreneur* and the *manager*¹⁴.

Literature about “entrepreneurship” has known a real increase¹⁵ at least a quantitative one¹⁶, with the crisis of the State Enterprise,¹⁷ the Big Corporation, the industrial work¹⁸ and the Fordist regulation¹⁹. The question at stake became the implicit or unknown, unmarketable or priceless reserves of further growth and deeper innovation in products, technological processes, procedures, institutions and modes of regulation. This involves a broad spectrum of contributions and approaches. We already mentioned (in footnote 10) some of these : appropriate technology, clusters and local systems of production (*distretti industriali*)²⁰. Others, like the “lean and flexible production” approach as well as the post Fordism of the French school of “regulation”, the neo-Schumpeterians²¹, the national systems of innovation and the culturalist²² paradigms have provided, I think, few breaking-path insights on the precise problem of entrepreneurship. Exception should be made for resource-based theory²³, population ecology or organizational theory²⁴, evolutionist theory²⁵ and endogenous growth theory²⁶ for reason which will soon become evident Since my purpose is not a review

¹³ Berle & Means (1932).

¹⁴ This distinction between the *manager* (incremental and marginal innovation) and *entrepreneur* who “locates new ideas” and “put them into effect” (Baumol, op. cit. p. 65) becomes more central in the end of the 1960-1970 when innovation in the great organization (administration as well as multinational) is dwindling and the famous book “Small is Beautiful” (E.F. Schumacher, 1973), the Third Italy (described in Piore & Sabel, 1984), the waves of start-ups of the Information economy and the Russian New Condottiere of the “Transition” have entered the picture.

¹⁵ For a review in sociology see for example, P. Thornton (2000) or R. Swedberg (Ed.) (2000). For a recent quite exhaustive book on entrepreneurship see Casson, Yeung, Basu & Wadeson(Eds.)(2006).

¹⁶ For a quite impressive review of the state of research in anglo-saxon world, see Acs & Audretsch (Ed.) (2003), Alvarez, Agarwal & Sorenson (Eds.) (2005), and Neergaars & Ulhøi (2007).

¹⁷ After the Great Depression, the State became involved directly in economic activity with a powerful nationalized sector in European countries, and a nonetheless important sector (specially in Defense and aeronautic) in the U.S., up to control 10 % of the working force employed in manufactures. By the end of the seventies, the market driven economies of the West started a reverse movement and the end of the USSR followed the same path of the neo-liberal privatization.

¹⁸ See for example A. Negri early works, A. Gorz (2001) and finally R. Reich (1991) and J. Rifkin (1995).

¹⁹ See the numerous contributions of the French Regulation School : Robert Boyer (2004), Benjamin Coriat, Alain Lipietz and Pascal Petit

²⁰ G. Becattini (1979 et 1987), A. Bagnasco (1977)

²¹ Hanush & Pyka (2007)

²² Shane (1993)

²³ Alvarez & Busenitz (2001)

²⁴ Hanan & Freeman (1989)^o

²⁵ Nelson, Winter (1982), Dosi, Nelson & Winter (2000)

²⁶ Romer (1986), Aghion & Howitt (1998)

of the entire literature I shall argue that a good leading thread to enlighten the present state of art about entrepreneurship, should start with taking into account the major macro change at a global level : what is called the “Information based society”, or the “knowledge based economy²⁷” and we call the third historical capitalism or “cognitive capitalism”.

I think that it is worthy revisiting some of the main “results” of ‘entrepreneurship’ basic theory (mainly in economics, but borrowing also some elements to the sociology) in the light of the gigantic earthquake or tsunami if you wish, we are experimenting in the undergoing transformation of the economy and capitalism. I shall therefore examine briefly some essential staples of this acquisition, as well as the essential characteristics of “entrepreneurship” are briefly summed up from the Genoa banker, to the slave trader, from the captain of industry, to the creative manager of giant firms, from the “diffused fabric” of “the second industrial divide” to the *Net Generation* start upper. In a more bottom-up approach, recent emphasis has been put on institutional entities (territories, digital networks, density of social interaction, population ecological model) as key factor of innovation.

2. Most remarkable features of the Entrepreneur incorporated into the main stream of economics.

In his short *Preface* to the vivid and refreshing book of R. Sobel and D. B. Sicilia, *The Entrepreneurs, An American Adventure* Alfred D. Chandler sums up a definition of the *entrepreneur* as follows : « *as an innovator who reshapes patterns of production and distribution by developing new products and processes, by opening new markets and sources of supply and by devising new forms or organization* »²⁸. This Schumpeterian definition is completed by the authors of the book who recall that the word itself, borrowed from the French, means “*one who manages and assumes the risk of a business or enterprise*”²⁹. If we want to get a more analytical view of the entrepreneurship, we probably have to pick up the main characteristics of entrepreneurship in Marshall, Veblen, Young, Schumpeter, Knight, Coase, Mises, Berle & Means and Simon.

We shall leave apart here,³⁰ recalled in row a) of table 1. Obviously the birth of *possessive individualism* which goes with the unification of the

²⁷ Foray & Lundvall (1996)

²⁸ Sobel & Sicilia (1986) p. IX

²⁹ Ibidem, p. 2.

³⁰ Veblen (op. cit. 1904, pp.21-22) stresses the link between modern business and its *coextensivity* with the machine process. Merchandizing or banking (insurance) before industrialization do not share this peculiar feature. Only shipping « *involved an investment in or management of extensive mechanical appliances and processes, comparable with the facts of the modern mechanical industries* ».

bundle of property rights under absolute and unlimited private property (with an hegemony of *abusus* over *usus* and *fructus*) is fundamental³¹. The Italian condottiere is not only a warrior but also a merchant (we would say a “businessman” or a “captain of ship”).

Rows b) up to row i) deal with the characteristics of entrepreneur and/or entrepreneurship dealt with by economists, and sociologists : b) an acceleration very rapid in output ; c) the casualty or total uncertainty of the outcome in terms of success or failure (which is more than the computable risk) ; d) The ex-ante unavailability of knowledge of all kinds of inputs or resources necessary to innovation (particularly human resources) ; e) The problem to ascertain a price on it and to found them in a time constraint framework ; f) the disruptive element that the subjective action of the entrepreneur is introducing in both worlds of production and society thru consumption, production of new social values and social conditions of organization of business; g) The opportunist exploitation of opportunities offered by resources, society itself, and the state of scientific and technical knowledge ; h) The control of internal organization; i) The capacity to finance the projects mostly in relying on a more and more sophisticated financial institutions, be they private or public and networks.

These nine characteristics are explained in the Table 1. I hold that distinctions between supply side and demand side, or functions of the entrepreneur and characteristics of entrepreneurial processes, as suggested by W.D. Bysgrave & C. W. Hofer³² are not the principal question at stake. The more nagging question is perhaps the weak creativity of the academic discussion linked to what Imre Lakatos would have called a degenerating research program³³. Most of the features, be they socio-organizational or verging on individual psychology or input/output based models of market opportunities, and although sometimes really valuable, suffered nevertheless from a great shortcoming that could explain their scanty productivity in new facts and results. If the program seems so little inventive, it must be ascribed

³¹ See Ostrom (1997), Moulrier Boutang (2005).

³² Bysgrave & Hofer (1991).

³³ The feeling of dissatisfaction among scholars and managers has lasted since the 1960. Disappointment is pretty evident. On the side of Management, somewhat disdain is shown in front of the theoretical discussion among economists. Bygrave & Hofer (1991) announced that the prickly question of definition is over and they proposed the following definition: “An entrepreneur is someone who perceives an opportunity and creates an organization to pursue it”(p. 14). But what is an *opportunity* ? Is it limited to the market signals , and in this case we are sent back to the difficulties of the disembodied neo-classical firm. More, what means *to pursue an opportunity* ? What kind of opportunity ? Those market is offering ? Or are those not yet marketable ? The second answer should be the good one, but in this case it should be explained thoroughly. On the other side of the mindscape, P. H. Thornton (1999, p. 2), a sociologist, proposes : “ *entrepreneurship as the creation of new organizations which occurs as a context-dependent social and economic process*”. But one could wonder if the problem is solved so doing. The word “Organization” forgets the question of institution (and the *authority* and *legitimacy* problem at least dealt with by R. Bendix (1963) and the two words *create* and *occurs* resemble more to a miracle than an explanation. In any case, the terms *explicans* and the *explicandi* terms are too mingled up to provide convincing arguments.

to the fact that it is too deeply rooted in industrial capitalism, which is largely vanishing now. By the way, as you may notice, this shortcoming in the theory is exactly the classical problem that entrepreneurship is supposed to solve : invention of a new development, of a more dynamic trend in markets, organizations, institutions and Government.

The table is built with four columns (main features of the ideal-type of the entrepreneur, bearer of social and ethic values just like the Protestant of Max Weber are sketched in column 1, operative concepts and functions of entrepreneurship processes in column 2, main contributors in the field in column 3, Remarks in column 4 generally explain why first and second columns are closely linked, and why an integrated socio-economic approach is needed³⁴ particularly in the case of growth, development, social change and entrepreneurship.

Table 1 Mains features of entrepreneur and characteristics of entrepreneurship incorporated within economics

Main features of the Entrepreneur (description)	Operative Concepts of entrepreneurship	Author or sources	Remarks
a) Greed Legitimacy of personal pecuniary motives ³⁵ <i>Libido sentiendi</i> Pride of loneliness and exception of “founding father”	Market and business oriented Practical and experimental minded Transgressing laws and tradition and establishing new rules	The classical and neo-classical theory of the firm Profit maximization Input costs minimization Specific profit of the entrepreneur distinct from retribution of the manager Ludwig von Mises (1949) ³⁶	<i>Homo oeconomicus</i> Individualism But also Mystic of creation of Institution (uniqueness)
b) Management of the representative firm within the context of a branch of industries Opportunities seeker	Technological and territorial positive externalities Increasing returns are different from the sum of internal	Alfred Marshall (1890) AMarshall (1919) I. Kirzner (1973) Allyn A. Young	Solve the problem of the gap between microeconomic decreasing returns and evidences of macroeconomic

³⁴ See R. Swedberg (2005)

³⁵ R. Swedberg (2000) in his presentation of Mises (1949)

³⁶ "The excess of gross receipts over expenditures which the classical economists called profit includes the price for the entrepreneur's own labor employed in the process of production, interest on the capital invested, and finally entrepreneurial profit proper" (Mises 1949, p. 535)

Rapid growth seeker	economies of the branch ³⁷ Innovation and development when there is slack in production and organization	(1928) Harvey Leibenstein (1968)	growth Entrepreneur fills the gap of the “no bridge” between macro and micro.
c) Means by which industrial balance is kept ³⁸ Tight link between industrial processes and business Strategic character of decisions	Knowledge of “the machine process” (technologies available) Discovery of resources and Financial control on it	T. Veblen (1904) <i>The Theory of Business Enterprise</i>	Subordination of industrial processes to chances of profit and outlook of market ³⁹
d) Intuition Evaluation and rapidity to provide resources and means to make them live thru marketable products and processes Opportunism Connectivity, use of personal networks Idiosyncratic exchange	Intuition (invention) of “categories of knowledge” rather than exercise of scientific knowledge ⁴⁰ Ascertain a price on it Exploitation of opportunities offered by already existing resources non yet perceived by solcity or competitors as assets	Frank Hyneman Knight (1921) Entrepreneurship highly dependant on Cognition in an un-probabilistic environment	Business more concerned by judgment on incomplete sets of events and complex than by rationale calculus of risk thru objective or subjective probabilities
e) <i>Unternehmergeist</i> , (spirit of entrepreneur) Innovator (diffusion of science to applied economy)	Creative destruction reform the pattern of production by exploiting technology possibility	Joseph Schumpeter (1911) But also T. Veblen (1904)	Theory of profit as differential rate derived from temporary technological and/or organizational

³⁷ « not all of the economies which are properly to be called external can be accounted for by adding up the internal economies of all the separate firms » A.A. Young, (1928)

³⁸ “ The keeping of the industrial balance, therefore, and adjusting the several industrial processes to one another’s work and needs, is a matter of grave and far-reaching consequence in any modern community, as had already been shown. Now the means by which this balance is kept is business transactions, and the men in whose keeping it lies are the business men” T. Veblen op. cit. p. 26.

³⁹ “Industry is carried on for the sake of business and not conversely ; and the progress of activity of industry are conditioned by the outlook of the market, which means the presumptive chance of business profits (...) The adjustments of industry take place through the mediation of pecuniary transactions, and these transactions take place at the hand of the business men and are carried on by them for business ends, not for industrial ends in the narrower meaning of the phrase”. (Ibidem, p. 27.

⁴⁰ For this unusual understanding of the difference between uncertainty and risk in Knight, I follow Langlois & Cosgel’ very enlightening interpretation (1993)

New products and or processes	reorganizing and industry. ⁴¹		advantage Exteriority of science (Invention) to production
f) Conquest of Ownership and/or control of knowledge And physical resources and assets Within and outside the mill to be incorporated	capital as business control over technological knowledge through tangible and intangible assets ⁴² .	T. Veblen (1908) Alchian (1969) Alchian & Demsetz (1972)	Capital as 'capitalized putative earning-capacity', expressed in terms of value ⁴³
g) The entrepreneurship as a manager can be more risk taker than the owner of the capital	Separation of ownership from supervision and control of the production process	Berle & Means (1935) Burnham (1941)	Control : The asymmetric contract, principal/agent problem But also the liberation form risk aversion
h) Entrepreneur as master in organization processes Manages transaction costs and provide or create or use new forms or organization as substitute to failure of market or Hierarchy	Transaction cost Substitute program of maximization of profit (market) by maximization of the volume of transactions and minimization of transaction costs	R. Coase (1937) and the transaction cost school of neo-institutionalism (Williamson, 1985) Alfred Chandler (1962)	Organization and hierarchy (Sate or Enterprise) are a rational substitutes to market driven processes when transaction costs of coordination thru market exceed expected gains
i) Mastering decision in incomplete, big, and complex organization	Satisficing criteria, Bound rationality <i>Homo prodecuralis</i> versus <i>homo oeconomicus</i>	Herbert Simon (1951 & 1955) ⁴⁴ Aoki (1990)	"Incorporating organizational considerations in choice making" ⁴⁵

⁴¹ "The function of entrepreneurs is to reform the pattern of production by exploiting an invention, or more generally, an untried technological possibility for producing a new commodity or producing an old way in a new way, by opening up a new source of supply of materials or a new outlet for products, by reorganizing and industry or so on". J. A. Schumpeter (1912).

⁴² Following Marc-André Gagnon interesting reading of Veblen (2006) "the concept of capital in terms of business control over technological knowledge through tangible and intangible assets can provide a general theory of power capitalization". And Veblen himself quoted by the former : "As the technological development falls into such shape as to require a relatively large unit of material equipment for the effective pursuit of industry, or such as otherwise to make the possession of the requisite material equipment a matter of consequence, so as seriously to handicap the individuals who are not without these material means, and to place the current possessors of such equipment at a marked advantage, then the strong arm intervenes, property rights apparently begin to fall into definite shape, the principles of ownership gather force and consistency, and men begin to accumulate capital goods and take measures to make them secure" (T. Veblen, 1908), p. 524.

⁴³ T. Veblen, op. cit. (1904) p. 131.

⁴⁴ H. A. Simon (1951)

⁴⁵ H. A. Simon (1955)

Creates new set of contracts between Agents	<i>Homo contractualis</i>	Steven Cheung (1983)	
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What should be stressed, as it appears in rows b), c), d), h) and i) is the importance, even under industrial entrepreneurship, of the functions of knowledge. Out of eight distinctive features, five deal with all aspects of activities of cognition and reason: intuition, categorization, schematization, judgment for practical purposes and choice. These operations reflect also a shift towards *meta-knowledge* which takes into account what the *substantive* rationality assumes as given or lacking (conditions of possibilities of goods tradable, of inputs, procedures, transaction costs). In modern societies extensive and intensive complexity is certainly the most prominent characteristic, and practical knowledge and knowledge cannot be isolated and separated. Most of the information necessary to update data comes from practical arrangements be they administrative, legal, or link to market activities⁴⁶. One more remark: entrepreneurship processes and entrepreneur's way of knowing and acting bring into the picture what was implicit and unseen before. The entrepreneur is the first to cumulate intellectual capital in an idiosyncratic way. In this respect, the return of entrepreneurship is not very surprising when capitalism puts in his core innovation, strategic management of still unexploited resources.

However, rather than continuity, entrepreneurship is experimenting a huge transformation in its main features within globalization and the birth of cognitive capitalism. Let us examine this point in our third and fourth parts.

3. Cognitive capitalism, how it changes the capitalism.

Whatever be the names or concepts that have been used to draw a correct picture of the undergoing changes, the opinion becoming dominant, is that discontinuity is a better guideline to understand the *ZeitGeist* than its opposite. Who could seriously doubt that intense and exhaustive transformations of the system of production, of the technology and the use of it, of rules of governance and finance, of the functioning of the markets have taken place at a global level within the "dreadful and shameful thirties"

⁴⁶ F. Von Hayek's contribution on this point (1945) was rediscovered precisely when complexity of globalization could not be grasped any more thru the usual tools of the National account system (Reich, 1992, pp. 25-42) created in the 1940 par the U.S. NBER and the macro-economics. On this later point, see R. Solow famous question about productivity in the seventies and the revenge of Hayek on Keynes.

(1975-2005)⁴⁷ ? This is the main reason why the discontinuity approach, of Schumpeterian mint, should be preferred to its opposite (Kirzner)⁴⁸. The integration of China and India in the world trade and the rapid development of market economy in the most populous countries⁴⁹ of the planet, must not hide that, by the same time, the core of the most developed centers of capitalism underwent an as huge growth of immaterial production⁵⁰ and a shift on intangibles assets which have change the meaning of value, of health, the concept itself of capital, the nature of the firm, the division of labor, the institutional arrangements of labor relations, employment and welfare.

Few words about the cognitive capitalism approach⁵¹

Three main transformations have taken place in thirty years. A) A huge change in labor processes is occurring in every department of production, investment, consumption and saving, with the massive spread of the use of ICNT. The appropriation by hundreds of millions of people of the digital divide (the computer, the Internet) plays a fundamental role and encounter no other precedent than invention of writing and invention of printing. B) Immateriality which has always play a role since the historical capitalism (let us think to the Genovese invention of the credit), is now becoming hegemonic. Hegemonic, means that in terms of market value, immaterial assets represent the greatest part market and monetary opportunities. C) Intellectual Property rights (IPR), but more generally, the bundle of rights⁵² splits and the hegemony of *abusus* (or transferability) since Locke is challenged by new practices but also by new economic models of doing business or organizing production, consumption, saving and investment.

Let us define cognitive capitalism by the following prerequisites and statement. A society can be characterized by the orientation of its accumulation and by the principles that leads it. By accumulation, we mean investments of a given society, in a much broader extension than the gross formation of fixed capital. By orientation of the accumulation we do not

⁴⁷ The 1975-2005 were called “Les Trentes Piteuses “ by the French economist Nicolas Baverez in contrast with the previous “Trente Glorieuses” (Thirties Glorious) of 1945-1975, as Fourastié had stamped them.

⁴⁸ Kirzner (1973)

⁴⁹ The entrance of China, India, Brazil in the international division of labor and markets produces such a scale effect that it cannot be purely quantitative (Arrighi 2007) . But the transformations that can be predicted are *already* acting on an *already* transformed capitalism, specially on R & D and science. Here as elsewhere the ceteris paribus rationale is of no use.

⁵⁰ On immaterial production and work see Lazzarato (1997), Leadbeater (2000), Moulrier Boutang (1998, 2007 B), Gorz (2003).

⁵¹ The research program on “cognitive capitalism” has been defined in Corsani, Dieuaide, Lazzarato, Monnier, Moulrier Boutang, Paulré & Vercellone, (2001). See also Corsani (2000).

⁵² E. Oström (1997)

mean simply what concerns the conditions of a satisfactory loop of macro-economics quantities. Accumulation is also characterized by its purpose and design. For the definition of the system of accumulation let us rely upon the connection of what the French school of regulation call a mode of production and a type of accumulation. For example, in industrial capitalism, accumulation concerns mainly machines and the organization of work dealt with as the organization of production and allocation of the workers at tasks, and we could say that it had introduced a bias vision of economy and society only grasped thru the dichotomy mill (production) versus market (circulation and consumption) which become challenged by the ICNT which allows immediate feedback between production and consumption. All the flexible production techniques (just in time, life time value), but also betterments in quality of product, efficiency in processes, innovation and increasing returns relies more and more on the digital revolution and its diffusion.⁵³

Cognitive capitalism is another system of accumulation. Accumulation rests on management of knowledge and production of innovation, hence on immaterial investments. In a system of cognitive accumulation, capture of returns driven from knowledge and innovation is at stake and plays a crucial role in the creation of profits. In such a system, questions of intellectual or immaterial property rights, of location within networks, of alliances, of management of projects are becoming institutional and organizational predominant issues. Logically, the strategy of the main actors are determined by the search of a spatial, institutional and organizational position that enhance the possibilities of being involved in innovative and creative process and getting profits from it.

In order to sum up cognitive capitalism as a coherent world system of the economy we have listed its 22 main characteristics. What the empirical analysis has sketched as several and unrelated features of nowadays capitalism, has reached in fact the maturity of development of a complex and global system that could be described through the following points :

1. Virtualization (immaterial) economy and increasing role of information.
2. Gathering of digital information in knowledge good and knowledge practical activities. Producers using PC (1986) more and more powerful (law of Moore) interconnected through the Internet and the Web.
3. Innovation induced by ICNT has not come to an end. One must speak of a new paradigm or socio-technical model which will be accelerated by bio and nanotechnologies.

⁵³ P. Paulré (2004)

4. The production of material commodities through means of other commodities is replaced by production of knowledge through means of knowledge and living activity and cooperation of brains interconnected.
5. Continuous innovation plays a fundamental and endogenous role. Knowledge and science, are directly embodied in the valorization process and are becoming the hegemonic part or leading part of the system of accumulation.
6. The Smithian model of division of work is infirmed on three levels: a) on the specialization of activities; b) on the dimension of the market; c) on its efficiency and productivity : innovation and invention are hindered by Taylorism and Smithian division of work rather than boosted by them . The networks provide others paths for working and cooperation.
7. Learning economies plays a key role in the diversification on the market and autonomy and intelligence tend to become the main source of value. Intelligence is capacity of human brain to contextualize knowledge and provide answers to new questions that had not been previously codified in software. Greatest part of intelligence is implicit knowledge and produces repetition with difference instead of mere repetition that has been absorbed into data, hardware and different kinds of software. Exploitation of the Inventive force instead of the labor force (what we call second level or grade of exploitation) is the main characteristic of cognitive capitalism.
8. Even if they remain as a necessary phase of production of commodities, the plant (the mill, the fabric or the corporation) and the material production are not anymore the core of the system. Just like agricultural production which occupied 90 % of Humanity is now reduced to 20 to 5 % of the active population.
9. Value changes with digitalization and capacity of computerization. Implicit knowledge, living activity (like care, attention), intelligence represent the core of the new commonwealth and also the core of exchange value and opportunity to “make money”.
10. To consume becomes a co-production in the just in time production since it allow to produce only what has been already sold. The market precedes production.
11. Notion of individual performance are replaced by a global performance extended to a team, a territory, local governance and a whole society of a country or new federations or confederations of states.
12. The traditional divisions between capital and labor are blurred. Capital monopole of means of production is challenged : a programmer or team of programmers can produced world commodities (Apache for example) with a piece of paper, a computer, a subscription to wifi connection to the Internet. He may claim for retribution of “his” product, which is not the case of the

proletariat of the white and blue collar worker which produces nothing. He only produces capital and has no right by definition on the value of the product since he has exchanged it for a steady and regular wage.

13. Each good (material or immaterial) is produced with four components that cannot be separated: the hardware, the software, the wetware (activity of the living brain) and netware instead of the binary division capital/labor.

14. Emergence of models of social and productive cooperation instead of competition, through the netware or networks of networks: E.g. the peer to peer model of production⁵⁴.

15. The netware or networks appear as a *tertium quid* between the market and the hierarchy (firms and States).

16. The labor must remain a living activity that is to say not reduced to machines or product when it is in motion in the labor process. This is the condition of its accumulation as implicit knowledge. That poses new problems of capture of activity under the contract of dependant worker.

17. Situated and implicit knowledge cannot be reduced to machine or to mere information (codified software or data). Commodification of knowledge faces three problems : a) as they are quasi public good their private appropriation can only be achieved thru social conventions (like the patents, the copyrights) and are not reproduced spontaneously by markets mechanisms; b) The digitalization of all kind of knowledge (be they fundamental and theoretical, or practical divide), the growing capacity of computing, copying and storage of information are removing in an increasing proportion the technical fences to property rights that used to help enforcement of intellectual property rights.

18. The separation of the labor force from the individual and the personal affects less and less effective. Just like the division between producing and learning.

19. The decline of standard forms of employment is not only related to the flexibility and precariousness of production, but increasingly to a constitutional crisis of the salary system. What is labor activity ? How to separate between labor force or “invention force”⁵⁵. This induces sharp transformations of definition of dependant labor contract in terms of the nature of the asset. Will it still remain time of use of consumption of a certain amount of energy ? Or time of collaboration of brains, or time of attention⁵⁶ of brain ? In that case, what could mean time of labor, labor day ? How to separate activity of the brain as a whole complex system (the most complex

⁵⁴ M. Bauwens (no date); Y. Benkler (2006).

⁵⁵ Lazzarato (2002).

⁵⁶ Patrick Lelay, former Executive of the main private TV channel in France (TF1) raised a certain emotion when he declared that his job was “to sell time of attention of brains available for Coca Cola advertisers” Indignation was intense, but the description of the real economic standards of entertainment industry was correct.

in the universe), from emotion of the body? All phenomenon of harassment or pain at work linked to digital work and cognitive activity are poorly taken into account by the industrial regulation system, not only because they are new and *cognitariat* ou *pronetariat* badly organized, but because these activities are new if compared to industrial work. It goes the same for what regards the special kind of discontinuity of the “precarious worker” in knowledge, care activities.

20. The expansion of indivisibility and interactions in complex systems leads to a radical reappraisal of the role of positive and negatives externalities. They cannot be considered as exceptions or marginal phenomena.

21. Externalities be they positive or negative, and whatever be their management, determine now the general conditions of growth, investment and redistribution of revenue. Capture of positive external effects produced by human activities refers to a great transformation of work and of the point of view thru which it is analyzed and socially recognized. The work of the bees (this fetish animal of the political economy from Mandeville do Mead) can be considered from two different points of view. The first, the traditional one (including Mead), consider the *output* of bees activities to be only production of marketable honey, their input being building up the alveoli, and transformation of pollen into honey, reproducing and defending the hive. The point of view more correct, more global and nowadays more vital both for survival of cultures and biodiversity in biological sphere, considers the *outcome* and the true components and the more important achievement of the bees. What do bees do ? The answer is : pollination. Why is it essential even from a purely economical point of view ? Because the economical, financial value of pollination is of another order than the output of honey production. Minimum estimation give bees outcome (pollination) to be a minimum of 28-40 times to a maximum of 373 times greater⁵⁷. Their production of honey (initially for their own reproduction, is negligible if we compared it to their production of positive externalities. 80 % of the vegetables and fruits on our planet need the pollination of the bees. Let us transpose the rationale from bees to human activities. Cognitive capitalism has discovered these hidden resources. His rational exploitation of the activities of the human bees is not to market their production of honey but the by outcome of their activity

⁵⁷ Various diseases are killing the bees allover the world. In the US imprudent introduction of the African Bees (via Brazil), genetic manipulation of European bees to make them resistant to an given infection that turned them vulnerable to a very old and endemic parasite, the overused of chemical fertilizer (particularly the Round up and the Regent of the Monsanto Corporation) have increase mortality of the bees in huge proportion (between 60 to 95 % of mortality instead of 10 %). Direct loss for marketable output in agriculture has been estimated to 2-3 billions of dollars per year. But recent broader estimations if the phenomenon was to last, have evaluated total out put of vegetables and fruits crop to 27-29 billions dollars.

(social pollination) and, if possible, to commodify it or if not, to make pollination the base of new economic models which include total or partial gratuitousness in exchange to free access to pollination which will, hereafter, create other marketable commodities or services. It is exactly what the powerful model of Google which trade off the activity and self revealing networks created because the firm have put in free access services needed for the activity of the population. Sophisticated dedications of advertising are replacing the traditional and expensive marketing techniques. Now the true objective of a firm becomes maximization of the audience, of the outcome more than maximization of profit because its value (its faire value and not only the in the book value), is the evaluation of the futures, of the promises, its intangible assets like its empowerment to shift rapidly from a given specialization, to innovate constantly, to retain it human capital, to persuade its stake holders.

22. The hypothesis of increasing returns or constant seems more plausible than the traditional hypothesis of decreasing returns when one has to deal with the production of innovation. Industrial capitalism the firm was the sanctuary of increasing returns and society and environment the void and unspecified space of consumption of goods, decreasing returns, routines and entropic squandering of energy concentrated in the factory. Things seem to have change radically. The non entrepreneurial firm seems to suffer from the decreasing returns fever and her revitalization to need inclusion of outside resources (outsourcing, crowdsourcing, data mining) in increasing proportion.

This new system of accumulation is not a structure, but a system with endogenous factors of evolution or blockage. It faces three major problems.

A) The vivid contradiction between the public character of knowledge, a technical problem but also a problem of legitimacy.

B) The creation of a new sort of commons necessary to the production of health and value and life environment is turning into a new public space which produces an increasing difficulty to enforce intellectual property rights and the new enclosures⁵⁸. But at the same time the battle around the new enclosures and new disclosures is shaping a new agenda for public policies.

C) A problem of instability in reality and of uncertainty in the categories, in its hidden resources, in the way to fix a prize for its components : markets and administrative prices are challenged by a new etalon for price which is measured by attention in networks and in the networks of networks : audience, number of hits on a web site which turn to be the initial “raw

⁵⁸ Moulrier Boutang, Y. (2002), Boyle (2003)

material” for transformation of any service and information into a commodity or an intangible asset.

Instability inside cognitive capitalism deserve a special comment. In the informational and cognitive economy (this includes R & D too) the value of a knowledge-good cannot be asserted thru market of private good or stock market of intangible assets (i.e. scarcity and marginal cost as in the traditional political economy). Its value fluctuates from almost zero (cost of its digital reproduction and transport) to infinite value (absolute *incomparability* which is the finest form of monopole of attention). This situation has fostered one of the highest rate of concentration of firms in the history. Enjoying a monopolist position in brand, in intangibles assets being the way to avoid zero or infinite costs. This has lead to average returns (profit earning ratio) of 15 to 20 %. This new standard of the knowledge based sector of the economy have been imposed to the old economy because shifting capital and human resources is needed, although such performance is quite impossible in the medium or long run as compared to the standard (5 to 12 % profitability of capital invested). Hence, we are facing now a mix tendency to foster bubble for the new economy and increasing difficulties of the old economy to match these requirements of financial institutions like Pension Funds.

The problem of uncertainty in the categories deserves also a brief comment. Increasing importance of externalities and of immaterial assets creates a problem of accountability for firms and public intervention. The “good will” issue, a key factor of speculation and in the birth and consolidation of bubbles, illustrates this problem. What are the most valuable assets when they are immaterial and not tradable as patents are? And what prices shall be given to them? I we take the example of the firms that produce typically knowledge good like software, only material good like machines enters in the books. But what about human capital, the real asset of these firms? Wages which are spent it, are considered a cost and not an investment whose cost can be recouped over several years. If we are to follow the usual requirements of accounting, these firms encounter a problem of profitability. Nasdaq in the US and the so called “second market” has been create to avoid three years of unbroken profit. The juridical status of the cognitive firm is still to come. In the absence of publics funding, speculation has become the ordinary mean to raise money. But it has increased instability at a macro-level. Deep reform in the accounting system (both the private and the public one) is taking place like the shift from the value in the books to the “fair value” measured in the stock exchange (new norms of IFRS). Finance and financierization are not a distortion of a sane and real economy but the

governance of new instabilities in the cognitive mode of production. The positions held by the movement of the “Intellectual capital”⁵⁹ or Baruch Lev⁶⁰ are the next winning positions among the Federal Reserve. Recently The Bureau of Economic Analysis/National Science Foundation has argued for an integration of intangibles assets like R & D in the national accounting system⁶¹. And it is very likely that the American twin deficit is less ominous than presented were intangibles assets or what has been called the “economic dark matter” of the new economy taken into a new accounting system⁶².

One can grasp easily the double difference between the industrial capitalism and the cognitive one. In the former, public goods and externalities are but limit cases. Whereas, in a cognitive society, health and the core of value are produced on the basis of knowledge goods whose indivisibility, unrivalry and non excludability pose a great problem to be commodified through the convention of private property inasmuch as the digitalization and reproduction challenges the traditional means of appropriation⁶³

Neighborhood of cognitive capitalism theory.

Before turning back to the entrepreneur, I would like to situate the cognitive capitalism among other programs of research that converge on some major orientations. The resource-based theory⁶⁴ in its strategic formulation (openness to resources that are not necessary internal), but also when it redesigns or reshapes the multidivisional division of task and organization, promotes projects and flexible boundaries. It registers the radical transformation of the source of innovation. Crowdsourcing thru the Internet has become an important mean for capturing positives externalities from the living activity of educated population⁶⁵. The intellectual capital approach does the same at a geographical level. Extracting value is now governance of external effects in a given space⁶⁶. Population ecology and evolutionist theory have also clearly identify that economic production is now production of life thru means of life, instead of production of commodities by means of commodities. Production in cognitive capitalism is a bioproduction and power is biopower (power, control, authority over a

⁵⁹ See for example N. Imparato (Ed.) (1999), Bounfour & Edvinsson (Eds.) (2005)

⁶⁰ Lev (2001)

⁶¹ Okubo & alii.(2006)

⁶² Nakamura (2005)

⁶³ Rivkin (2002), Moulier Boutang (2002), Lessig (2002), Benkler (2007)

⁶⁴ Alvarez & Busenitz (2001)

⁶⁵ See Tapscott & Williams's (2006, pp. 7-10) analysis of the case of the Goldcorp which decide to disclose its data in ore reserve to submit to a public concourse a more accurate evaluation.

⁶⁶ Bounfour & Edvinsson (2005).

numerous and highly differentiated population in a complex society)⁶⁷. The entropic and mechanical model of the industrial capitalism is replaced by complex systems of the biosphere which borrow most of its concepts to biology and Evolutionary theory. The relationship with environment cannot obey the classical input/output model, neither the transaction cost model. Ethnic business theory⁶⁸, network analysis⁶⁹, territorial analysis of networks in electronic clusters⁷⁰ poses all the question of the intellectual, social or network capital as a new resource and wealth⁷¹.

Endogenous growth theory⁷², on the other hand, unlike the neo-Schumpeterian paradigm of the firm which relies upon a clear exteriority of the science to the applied field of innovation and practice of the entrepreneur, assumes, very close to the cognitive capitalism program of research, that production of science and production of innovation are not any more spheres distinct and external to one another. Only a unified concept of immaterial accumulation of knowledge as living activity of the brain connected in digital networks can explain global productivity and the development of new profitable activities, that is to say, fill up the rather vague or tautological concept of opportunity of a content that matches the conjuncture and the *ZeitGeist* of now a day capitalism⁷³.

4. Cognitive capitalism, how it changes entrepreneur and Entrepreneurship.

We shall limit our remarks to the most prominent transformations in capitalism that have change to quite significant extent the characteristics of entrepreneur and entrepreneurship, as they were summed up in Table 1. Leaning on Table 1, whose main results are recalled in column 1, we have listed the changes brought in by “cognitive capitalism”⁷⁴ whereas Column 3 characterizes the new features of entrepreneurship and the entrepreneur.

⁶⁷ Bio power refers to all the new techniques of production of life thru life (human, living species, plants and conditions of reproduction of biospheres. Biopolitics deals with all the phenomenon of political power at stake in any form of bioproduction. Ethical debates about abortion, genetically modified seeds, cloning of human or animal occupies now a large spectrum of entrepreneurship in news markets or in new embeddedness of the bio-market. See Foucault and Negri & Hardt for discussion about biopower and biopolitics.

⁶⁸ Aldrich & Waldinger (1990).

⁶⁹ Burt (2005), Granovetter (1985)

⁷⁰ Saxenian (2000)

⁷¹ See for a global discussion of these issues in a spatial perspective Bounfour & Edvinsson (Eds) (2005)

⁷² Romer (1986)

⁷³ This matching is reached if contemporary description of stylized facts encounters a quite good reception among managers and entrepreneurs themselves, and are not contradictory with accurated and completed analysis of the corpus of practices and discourses as you encounter for example in Boltanski and Chiapello (1999).

⁷⁴ On “cognitive capitalism” and its difference with the Information society, the Knowledge based economy paradigms see B. Paulré (2004), Y. Moulier Boutang (2007 B)

Column 4 draws attention on some general consequences for the political economy.

Entrepreneur as a ideal-type or entrepreneurship as a general trait are both highly dependent on branch or sectors of activity or on local conditions like the cluster theory as shown although in a more descriptive than prescriptive or predictive way. Entrepreneurship had seemed a dilution of the precise contours of entrepreneur's characteristics, in particular a steady rooting in profit seeker and market oriented and within the strict boundaries of the firm enclosed activities. Extension of entrepreneur concept to trade, finance was not a problem. With the increasing role of external effects, the end of hegemony of the great corporation, the idea and the practice of entrepreneurship regains more legitimacy : speaking of entrepreneurship inside the public central or local administration, does not seem odd any more. Entrepreneurship is a quality claimed for at every level of society. Does it reflects only the diffusion of corporate governance at any level of the society ? It could mean also that the optic of pollination and global vision at a social level is required to ensure the more interesting possibility of profit, if not of any profit "tout court". The discovery of new opportunities (*id est* of perspectives or promises of profit in the future) is provided by social cooperation and collective entrepreneurship more than thru the mediation of individual figures or heroes of industrialization⁷⁵.

In this draft we shall not comment each of the rows and columns of Table 2. The reader will find in column 3 and 4 further comments. Let us stress upon the greatest oppositions between the entrepreneur and entrepreneurship in the industrialist capitalism and capitalism at the information and digital era in a cognitive society.

Relations to money, market, work, time, leisure, division of work, hierarchies, organization, institutions are deeply modified both in discourses, ideology, values, and in practices. If von Mises had characterized correctly the profit motivation as a simple but clear criteria departing invention, creativity from entrepreneurship and the market orientated activities⁷⁶, it is not so sure today that entrepreneurship in cognitive capitalism will fit this model. In an information society, networks, reputation and fame very often determine the possibility itself or raising funds and undertaking activities in the market or in society. This model in long run oriented and resembles the

⁷⁵ Casson, Yeung, Basu & Wadeson (2006) pp. 7-8.

⁷⁶ Mises (1949)

artists and writers achievements. Success can be immediate, but, most of the time, a very “long tail”⁷⁷ process is required.

Mutation of work and division of labor provide another important difference in entrepreneurship. Under a Smithian division of labor, planning and organization of production are function of the scale of markets and decreasing returns. In cognitive division of labor, tasks and problems are function of available resources in social or intellectual capital in networks. The size of networks increases the probability to solve a problem and how quickly you can answer, find the competences and assembly them⁷⁸. The quality of the members of the list on network working in peer to peer production, depends on reputation of the others members, trust. Flexibility, speed in increasing quality or correcting mistake cannot be achieved by sophisticated arrangement but by very simple hardware and software of networks and increasing sophistication an competences of people at work. The more the competence, the less overseer and control is needed. This new division of work does not produce the kind of hierarchy Durkheim had deducted form Adam Smith and the technology.

Third remark : the increasing role of multi level interactions and externalities reshape the classic role of intermediation of entrepreneurship between two spheres . The two spheres generally dealt with two different kinds of industries or markets or consumption. In the case of a society of knowledge and bioproduction, the great job of the entrepreneur is the frontier between the sphere of externalities, hence of non market activities and their capture and transmutation into marketable services even if this services relies upon free products or free access. The specific knowledge of entrepreneurship is the apiculture of positive externalities. Whereas the manager resembles the agriculture of agro-industry, the entrepreneur will consider human activity as valuable (even in money, profit and personal pay off) in the extent to which it produces pollination of society and increases opportunities for marketable activities to appear or will increases the value of the global outcome of society.

Table II Entrepreneurship under industrial and cognitive capitalism an overview

Main features of the Entrepreneur of the	Main changes in cognitive capitalism	The spirit of the Entrepreneur in	Remarks
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⁷⁷ Anderson (2005)

⁷⁸ Best description of this revolution of political economy can be found in the seminal article by Benkler (2002).

industrial capitalism.		cognitive capitalism	
a) Greed Personal pecuniary motives <i>Libido sentiendi</i> Pride of loneliness and exception of “founding father”	Pride of fame <i>Libido ludendi</i> <i>Libido gloriae</i> Pride of cooperation and connectivity Profit deducted of success in reputation and not the reverse.	Production of publics Access to world or concrete experience Connectivity ⁷⁹ , opportunism, Intelligence of political effects in society ⁸⁰ , cyber strategic, altruist	Shift of the Trade off of entrepreneurship in the long run Capacity to manage a team, generate collective rules, bridge links between firms and territories.
b) Management of the representative firm in the context of a branch of industries Opportunities seeker Rapid growth seeker	End of hegemony of industrial processes in the search of economic value Positives externalities become predominant ⁸¹ Crisis in the boundaries of the Firm. Modern finance confronted to the <i>pure player</i> versus <i>incomparability</i> dilemma ⁸² Entrepreneurship and strategy become unified management and governance thru finance tools	From capitalist entrepreneur to social entrepreneurship or General Intellect activity. Social & Global productivity taker rather than productivity maker Organizing collective intelligence Capture of positive externalities Understanding of globalization and of the third divide (networks instead of the traditional polarity hierarchy (State administration and Big Corporation versus market)	Pollination of positive externalities Work is defined beyond individual result ⁸³ Instead of paying exclusively attention to the bees as producing marketable honey, it appears that their main productive work is their pollination (= producing positive externalities for the economy as a a complex system) Public Entrepreneurship as recreation of the missing “social link”
c) Means by which industrial balance is kept Strong link between industrial processes and business Strategic character of	Global connection and integration thru network without necessity to grow big Networking ⁸⁴ Peer to peer production ⁸⁵	Outsourcing and seizing opportunities yielded by external resources, mass collaboration, networks and communities ⁸⁷	Subordination of industrial processes to chances of audience and global outcome as intangibles assets Linkage between

⁷⁹ Boltanski & Chiapello (1999)

⁸⁰ See the thesis of the “entrepreneur as a politician of the social” developed by Lazzarato, Negri, Santilli & Moulier Boutang (1993) and Corsani, Lazzarato, Negri & Moulier Boutang (1996)

⁸¹ Moulier Boutang (1997, 2006, 2007)

⁸² Rebiscoul & Moulier Boutang (2005)

⁸³ M. J. Piore, (

⁸⁴ Burt (2000).

<p>decisions Knowledge of “the machine process” (technologies available) Discovery of resources and Financial control on it</p>	<p>And connecting worlds Digital revolution split intellectual labor in Hardware, Software, Netware and Wetware⁸⁶ Automatic and repetitive intellectual activities become reduced to codified labor of which most valuable part of activity is production of innovation</p>	<p>Legitimacy relying upon knowledge or practical knowledge of society and the City of Project⁸⁸</p>	<p>engineering of processes and markets is challenged by direct regulation thru finance and contracts Return to formal subsumption Managing complexity and uncertainty thru new techniques (non statistics but fluzzy) mathematics tools⁸⁹ And thru public or convergent judgment on futures assets</p>
<p>d) Intuition Evaluation and rapidity to provide resources and means to make them live thru marketable products and processes Fulfill gaps and market failures Opportunism Connectivity, use of personal and hierarchic networks Idiosyncratic exchange Intuition (invention) of “categories of knowledge” rather than exercise of scientific knowledge or ascertaining a</p>	<p>Capture of positive externalities which save money and provide better solutions more than exploring and testing already existing markets. Use of horizontal networks as a substitute to market failures Leisure class and fashionable Common syncratic exchange. Crisis in hierarchical control of information Horizontal cooperation</p>	<p>Entrepreneurship highly dependant on Cognition in an un-probabilistic environment On intellectual watch On transformation and invention of uses and collective practices of the ICNT Art, fashion, artistic and intellectual creation used as a way to accumulate implicit knowledge that scientific or engineering techniques cannot achieved. Leadership in project Diffusion of entrepreneurship as a</p>	<p>Judgment and assertions on future and complex events are realized thru “speculation” and the formation of common values on the networks. Finance and advertising becomes part of a more general process of evaluation of intangibles assets and externalities. Inventing new business models which face the Intellectual Property Rights enforcement problem (DRM)⁹²</p>

⁸⁵ See Benkler (2006) and Bauwens (2006)

⁸⁷ Corsani & alii (1996).

⁸⁶ Moulrier Boutang in Corsani, Dieuaide & Azaïs (2001) and in C. Vercellone (2003)

⁸⁸ Boltanski & Chiapello (1999)

⁸⁹ Zalila & alii (2001)

<p>price on it .</p> <p>Authority</p> <p><i>Libido dominandi</i></p>	<p>challenges top-down And promote equal and long term relationships⁹⁰</p> <p>Fundamental change in kind and characteristics of authority and command</p> <p><i>Libido sciendi</i></p>	<p>massive competence Shift from qualification of employment to competences of the individual and collective team⁹¹</p>	<p>Priority given to exploitation of second grade or kind⁹³</p> <p>New combination of labor beyond wage system</p>
<p>e)</p> <p>Unternehmergeist, (spirit of entrepreneur) Innovator (diffusion of science to applied economy)</p> <p>Creative destruction reform the pattern of production by exploiting technology possibility reorganizing and industry. New products New processes New resources</p> <p>New markets</p>	<p>Start upper with Networker and netbroker</p> <p>Creative communication Invention of new models of business (e-business, e-trade)</p> <p>Increasing involvement in the public debate (on sustainable growth, environment issues and equitable trade)⁹⁴ search of trust and loyalty as remedies to unsteadiness of markets of products and inputs</p>	<p>Consumption is production Feedback and continuous innovation⁹⁵ Increasing return⁹⁶ Incomplete Product “Design capitalism” the production of the product achieved thru an interactive procedure pro-sumer New resources : the activity of multitudes (group, community, networks) and democratization⁹⁷</p> <p>Comparability in prices and product almost perfect.</p>	<p>Theory of profit as differential rate derived from technological and/or organizational advantages of the digital economy and networking</p> <p>Interiority of production of science to technological processes</p> <p>Distinction between fundamental and practical knowledge abolished by its digitalization.</p> <p>Extreme volatility and unsteadiness</p>
<p>f)</p> <p>Conquest of</p>	<p>Access to the use or</p>	<p>Human capital,</p>	<p>Capital as ‘human or</p>

⁹² Y. Moulier Boutang (2002, 2005)

⁹⁰ Saxenian (2000)

⁹¹ Boltanski & Chiapello (1999), Moulier Boutang (2004).

⁹³ Y. Moulier Boutang , Marx in Kalifornien... (2002)

⁹⁴ See for example Lemoine (2007)

⁹⁵ Lundwall (1988), Hippel (1998)

⁹⁶ Arthur (1996).

⁹⁷ Hippel (2005)

<p>Ownership and/or control of knowledge, technology, physical resources & assets</p> <p>Within the mill or to be integrated inside the mill</p> <p>Patent and copyright prominent model of IPR</p>	<p>resources and combination of inputs inside the mill and outside the mill not to be integrated into the firm</p> <p>Decline in the bundle of property rights of abusos</p> <p>Revenge of usus⁹⁸</p> <p>Brand, trust and audience prominent models</p> <p>Creative commons models⁹⁹</p> <p>Gratuitousness model.¹⁰⁰</p>	<p>intellectual capital and social capital¹⁰¹</p> <p>approaches</p> <p>Importance of the weak links in networks hence uselessness to select and hire the strong ties in a network¹⁰²</p> <p>Return to interpersonal links to define conditions of use or intangibles. Importance of trust versus market</p> <p>The challenge of the new economic models of the low cost¹⁰³</p>	<p><i>intellectual living activities</i>’ capitalized putative earning-capacity’, expressed in terms of value</p> <p>Collective and /or common forms of access to use</p> <p>Problem of invisible hierarchies and limitation to access</p>
<p>g)</p> <p>The entrepreneurship as a manager can be more risk taker than the owner of the capital</p>	<p>Start upper as freed temporarily from the market constraints can be more profitable and innovator than the manager</p>	<p>Creation of institutions lightening transaction cost, learning cost and reducing risk</p>	<p>The gap between Entrepreneurship and scientific inventors or artists becomes narrower.</p>
<p>h)</p> <p>Entrepreneur as master in organization processes</p> <p>Manages transaction costs and provide or create or use new forms or organization as substitute to failure of market or Hierarchy</p> <p>Transaction cost</p>	<p>Network entrepreneurship masters ICNT,</p> <p>Reduction of transaction cost not so important because provided by digital technology and Internet</p>	<p>The Hacker Ethic of work¹⁰⁵</p> <p>Considerable reduction in the search of the resources and competences needed already existing or available at low cost¹⁰⁶.</p>	<p>Organization and hierarchy (Sate or Enterprise) are a rational substitutes to market driven processes when transaction costs of coordination thru market exceed expected gains</p>

⁹⁸ Rifkin (2000), Lessig (2002), Boyle (2003), Moulrier Boutang (2002)

⁹⁹ Benkler (2006)

¹⁰⁰ Lentschener (2007)

¹⁰¹ Burt (2005)

¹⁰² Granovetter (1978)

¹⁰³ Lentschener (2007)

¹⁰⁵ Himanen (2001)

¹⁰⁶ Benkler (2002)

Substitute program of maximization of profit (market) by maximization of the volume of transactions and minimization of transaction costs	Maximization of the volume and quality of information thru procedures of data mining, screening and sorting. The long tail principle ¹⁰⁴	New territories of knowledge	
<p>i)</p> <p>Mastering decision in incomplete information, within big, and complex organizations</p> <p>Satisficing criteria, Bound rationality <i>Homo prodecuralis</i> versus <i>homo oeconomicus</i> <i>Homo contractualis</i></p> <p>Creates new set of contracts between Agents</p>	<p>Mastering decision in real time</p> <p>Transmission of information in small organization connected in networks</p> <p>Consensus criteria Connected rationality <i>Homo iugans</i> Connecting people</p> <p>Versus enclosures, monopolies and idiosyncratic behavior</p> <p>Informal links without contracts</p>	Webmaster Hacker	Incorporating networks in the process of decision

5. Perspectives and problems

To come to a short conclusion, let me list three problems that should be brought on the agenda of the program of research called “the cognitive capitalism issue” and the “entrepreneurship dilemma”.

The first one is the problem of transformation of the status of dependant labor and employment within such a new kind of capitalism but also of the welfare state and principles of redistribution and taxes¹⁰⁷. Transformation in value, in labor implies a serious crisis of the old system of protection the dependant labor had been in grade to achieve in the late industrial capitalism (the 1945-1975). Activity and dependant work has not disappeared but the convention of employment and the “good old” job are fading away very fast. Guaranteed income not relying upon the job, but

¹⁰⁴ Anderson (2006)

¹⁰⁷ See Castells & Himanen (2005), Moulrier Boutang (2006).

insuring a general condition of bio-production and of knowledge production seems both a theoretical and a political proposal.

Instability of cognitive capitalism raises the issue of the articulation of cognitive capitalism with the old capitalism and alliances progressive forces should or could pass¹⁰⁸. Just like industrial capitalism has hesitated during a century (1789-1888) between articulating itself with the slave system and the destruction of it, will cognitive capitalism choose the path of revolution or the dead end of counter-revolution? This problem deals with the problem of instability of the convention of value: finance is not mere speculation but one of the best place to read the true new contradictions between a knowledge society and capitalism “tout court”.

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¹⁰⁸ It is not by chance that R. Florida (2002) rehearse the idea of Veblen (1899).

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