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Representing Impact of Cultural Transition in the Works of Pierre Levy

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ABSTRACT: Pierre Lévy (French: [levi]; born 1956) is a Tunisian-born French philosopher, cultural theorist and media scholar who specializes in the understanding of the cultural and cognitive implications of digital technologies and the phenomenon of human collective intelligence.

He introduced the collective intelligence concept in his 1994 book L'intelligence collective: Pour une anthropologie du cyberspace (Collective Intelligence: Mankind's Emerging World in Cyberspace).[1][2] Lévy's 1995 book, Qu'est-ce que le virtuel? (translated as Becoming Virtual: Reality in the Digital Age) develops philosopher Gilles Deleuze's conception of "the virtual" as a dimension of reality that subsists with the actual but is irreducible to it. In 2001, he wrote the book Cyberculture.

He was a professor at the communication department of the University of Ottawa,[3] where he hold a Canada Research Chair in Collective Intelligence. Lévy is fellow of the Royal Society of Canada and received several awards and academic distinctions. Pierre Lévy is currently retired and works on developing the Information Economy MetaLanguage (IEML).[4][5]

KEYWORDS: Pierre Levy, French, intelligence, cyber, culture, economy, metaLanguage, digital age

I. INTRODUCTION

Lévy was born in Tunisia, to a Sephardic Jewish family, before moving to France. He is one of the major philosophers working on the implications of cyberspace and digital communications. Lévy has written a dozen of books that have been translated in more than 12 languages and are studied in many universities all over the world. His principal work, published in French in 1994 and translated into English, is entitled Collective Intelligence: Mankind's Emerging World in Cyberspace.[6]

As early as 1990 Lévy published a book about the merging of digital networks and hypertextual communication. Lévy's theory of knowledge spaces and the cosmopedia foreshadowed the emergence of Wikipedia and anticipates wikinomics, and the efficacy of shared distributed knowledge systems.[7]

From 1993 to 1998 Lévy was Professor at the University of Paris VIII, where he studied the concept of collective intelligence and knowledge-based societies. He has contributed to many scholarly discourses about cyberculture.[8]

He was a member of the editorial board of the Revue virtuelle project of the Pompidou Center in Paris from 1995 to 1997 and was the author of a report on cyberculture for the Council of Europe in 1996.

In the chapter Interactivity from his book Cyberculture (2001), Lévy argues that analogue communication (telephone, mail) differs from digital communication (email, chat) in terms of temporal organization and material involvement of their communication systems. He claims that interactivity is a vague term that "has more to do with finding the solution to a problem, the need to develop new ways to observe, design, and evaluate methods of communication, than it does with identifying a simple, unique characteristic that can be assigned to a given system".[9] Henry Jenkins, among others, cites him as an important influence on theories of online collective intelligence.

In Becoming Virtual: Reality in the Digital Age Lévy explores the way we virtualise every aspect of our lives, from real time (media) interaction through language, to our actions through technology, and our social relations through institutions. And in each case the mechanism is the same: we create some artifact, more or less material, which allows

us to shift what's at stake away from the immediate here-and-now and towards a problematic where new possibilities open up.

Lévy's current project focuses on the development of an Information Economy MetaLanguage (IEML)[10] for the purposes of improving knowledge management as part of his works on the design of a universal system for semantic addressing of digital documents.[11][12][13]

II. DISCUSSION

The number of travelers along the information superhighway is increasing at a rate of ten percent a month. How will this communications revolution affect our culture and society? Though awed by their potential, we've feared computers as agents of the further alienation of modern man: they take away our jobs, minimize direct human contact, even shake our faith in the unique power of the human brain. Pierre Levy believes, however, that rather than creating a society where machines rule man, the technology of cyberspace will have a humanizing influence on us, and foster the emergence of a "collective intelligence"--A meeting of minds on the Internet. Needing guidance and seeking insight, the Council of Europe approached Pierre Lévy, one of the world's most important and well-respected theorists of digital culture, for a report on the state (and, frankly, the nature) of cyberspace. The result is this extraordinary document, a perfectly lucid and accessible description of cyberspace-from infrastructure to practical applications-along with an inspired, far-reaching exploration of its ramifications. A window on the digital world for the technologically timid, the book also offers a brilliant vision of the philosophical and social realities and possibilities of cyberspace for the adept and novice alike. In an overview, Lévy discusses the distinguishing features of cyberspace and cyberculture from anthropological, philosophical, cultural, and sociological points of view. An optimist about the future potential of cyberspace, he eloquently argues that technology-and specifically the infrastructure of cyberspace, the Internet-can have a transformative effect on global society. Some of the issues he takes up are new art forms; changes in relationships to knowledge, education, and training; the preservation of linguistic and cultural differences; the emergence and implications of collective intelligence; the problems of social exclusion; and the impact of new technology on the city and democracy in general. In considerable detail, Lévy describes the ways in which cyberspace will help promote the growth of democracy, primarily through the participation of individuals or groups. His analysis is enlivened by his own personal impressions of cyberculture-garnered from bulletin boards, mailing lists, virtual reality demonstrations, andsimulations. Immediate in its details, visionary in its scope, deeply informed yet free of unnecessary technical language, Cyberculture is the book we require in our digital age

Lévy's writing grew prolifically towards the end of the nineties so that by the new millennium his work formed a large, influential and coherent body. Since his style often shifted between the erudite and the popular he had attracted an eager audience ranging from the readers of Magazine Litteraire to the MEPs of the European Parliament in Strasbourg. It would be unfair to label him as an apologist for the burgeoning information society although his theme is often bordering on the evangelical, no, Lévy does examine the human condition in cyberspace bringing to bear interesting and illuminating theoretical approaches to understanding the Information Society at the start of the new millennium.

Pierre Lévy is a professor in the Department of Hypermedia at the University of Paris-VIII, scientific advisor to the TriVium company, and member of the advisory board of the Pompidou Center's Virtual Review. He holds advanced degrees in sociology, the history of science, and the sciences of information and communication, and has published numerous works in French on new technologies.

The term "cyberculture" permeates speech in various areas of contemporary society, referring to an issue that is extremely important, both because of its complexity, and because of its impact on cultural changes that affect all sectors of society today, and particularly education and educational processes. "Cyberculture" expresses the key elements involved in developing a digital culture that can be explored in all learning spaces and times. This article aims to analyze some of the complexities of cyberculture, using three works by the French scholar Pierre Lévy, namely: "Les technologies de l'intelligence" (1993), "Qu'est ce que le Virtuel?" (1996), and "Cyberculture" (1999). By detailing these complexities, we aim to make it easier for people and educational institutions to participate in the construction of the positive processes that cyberculture makes possible. Moreover, this fundamental discussion addresses society's understanding and, from this perspective, aims to identify possibilities and opportunities to improve educational processes.

III. RESULTS

Several authors have devoted themselves to characterizing contemporary society. Among these is Pierre Lévy, a French sociologist and philosopher who was born in Tunis (Tunisia) in 1956. Lévy is one of the most prominent thinkers in the field of contemporary virtual culture. He completed his studies in France, receiving a Ph.D. in Sociology and Information and Communication Sciences. He taught in several French and Canadian universities and is an important contemporary researcher in the field of new digital media, as well as an enthusiast about the cognitive and anthropological possibilities inherent in the Internet.

Lévy (1999) defines cyberculture as a set of material and intellectual techniques: practices, attitudes, modes of thinking, and values that have developed alongside the growth of cyberspace. Understood as a synonym for "network", cyberculture offers a new medium for communication, arising from the worldwide interconnection of computers. These definitions of cyberspace and cyberculture are sufficient to introduce the theme, although insufficient for an adequate understanding of the complexity of this field.

In his books (1993, 1999), Lévy defends the idea that cyberspace is a product of the real social movement of (cyber)culture, because the personal computer was created by Californian youngsters on the margins of the system who wanted to create new informatics bases to revolutionize society. Along with personal computers, digital networks were developed by groups of educated metropolitan young people; their ordered words and coherent aspirations represented strong cultural streams and promoted reciprocal communication and collective intelligence.

For the author, cyberspace is much more than just a resource or technical solution—it is one of the most fantastic examples of international cooperative construction, and the technical expression of a movement that began from the bottom, constantly fed by a multiplicity of local initiatives. It targets, through any kind of physical connection, a particular type of relationship among people.

As Lévy (1999) points out, Le Cyberspace constitutes an impressive achievement: the appropriation of the means of production by its very own producers. The advent of cyberspace places back in the hands of individuals the main tools of economic activity, which, in our age, are personal computers and digital networks.

Understanding the dynamics of cyberculture and the logic of cyberspace changes the way we notice concepts, and indeed, what those concepts represent for the future of humankind. Lévy (1993) affirms that, although technique is one of the fundamental dimensions of cyberculture and cyberspace, what is on the table is in fact the transformation of the human world by human beings. There is no well-defined, actual distinction between man and technique, or between life and science; those distinctions are created for the purpose of analysis. In using such concepts for precise purposes, we should not regard them as radically separated ideas. According to Lévy, we cannot express technique either in relation to moral condemnation or as a separate aspect of the group's (or world's) cultural signification change objectives.

To better understand cyberculture from a perspective that combines technique, politics, and cultural projects, Lévy (1993) notes that informatics and cyberspace are products of the historical evolution of what he calls intellectual technologies or intelligence technologies. Throughout history, human beings created three great types of intellectual technologies to express their intelligence: orality, writing, and informatics. Understanding the evolution of intellectual technologies is fundamental to understanding cyberculture, because they unmake and remake cognitive ecologies[1], from which we derive the cultural foundations that command our apprehension of the real. In this study, the most relevant aspects of each intellectual technology will be presented.

For Lévy (1993), orality refers to the role of the word in the era before human groups adopted writing. In those early societies, the word was used not only for everyday practical communication, but to manage social memory, its core function.

According to Lévy (1993), in oral society, the most appropriate representations met the following criteria: 1) They were very interconnected: the information they shared was not organized in a modular or systematic way; 2) The connections between representations involved relationships of cause and effect; 3) Propositions referred to the domains of concrete and familiar knowledge; 4) The representations were tightly bonded with "life issues", directly involving the subject and propelled by emotion. Thus, members of a society without any writing are not "irrational" because they believe in myths; instead, they use them as codification and memorization strategies.

For this reason, dramatization, personalization, and narrative artifices not only give pleasure to spectators, they are also the perennial conditions of a set of propositions in an oral culture. The time of orality has a cyclic character; the passage of time presupposes a never-ending movement of re-starting. It is a time of changing—the narratives alter according to circumstances, and transmission is always recreation. Inside a dimension of time and space, it is possible for orality to be restricted to the place and moment where it occurs. In addition, once it has acquired a very specific dynamic, it demands a communication process capable of superficiality, so that communication can be effective among all individuals who take part in it. Without this, discourse can lose its meaning for someone who has not mastered the theme being discussed.

The second intellectual technology defined by Lévy (1993) is writing, which added theory, logic, and the interpretation of texts to the mythical narratives of human knowledge. The creations of the alphabet, printing, and improvements in writing were essential for the establishment of science as a dominant mode of knowledge and world record-keeping.

Lévy affirms that writing, by interposing an interval of time between the transmission and reception of a message, generates a radically new situation in practical communications; for the first time, discourses can be separated from the private circumstances in which they were produced. For this reason, when ambiguous, out of context messages begin to circulate, meaning assignment starts to occupy a central place in the process of communication. Interpretation starts to become very important.

As the text can be isolated from its private conditions of creation and reception, writers seek to build discourses that are sufficient in themselves. According to Lévy, writing notation became more comfortable to enable the conservation and transmission of separate modular representations, independent of rituals and narratives. Individuals in written cultures therefore tend to think in categories, while people in oral cultures first capture situations.

As we move from ideography to the alphabet and from calligraphy to printing, signs are placed in a sequential order on the page; this is why time also becomes more linear and historical, and history becomes an effect of writing. This shift gave rise to a new genre of knowledge presentation—the analytic method, which was diametrically opposed to the scholastic style. Once the subject began to be taught and included in manuals in a specialized way, it was projected onto a table or tree, cut into fractions, and afterwards distributed in a book as part of a general plan. Old manuscripts imitated oral communications (questions and answers, pro and con discussions), and were organized around a comment from a great text or proposed selected fragments and compilations. Gutenberg's press allowed a new cognitive style to be established, in which the silent inspection of maps, schemes, graphics, and dictionaries became, from that point on, the center of scientific activity.

Through writing, the relationship between communication in time and space is transformed. The message is no longer bound to a moment or a specific place, but to the duration and availability of support for writing, which tends to be perpetuated. From the point of view of a message's reach and its degree of complexity, writing also greatly amplifies the possibilities for distributing and understanding a message. On the other hand, immediate possibilities for dialog become weaker as the time and space between writers and readers expands.

Lévy (1993) presents informatics as the third intellectual technology, repre- sented by computers and digital networks. Computers have a series of material devices and layers of software that re-cover and interface with each other. Those layers, which are innovations of informatics, derive from other fields, including electronics, telecommunications, laser and other sciences, mathematics, logics, cognitive psychology, and neurobiology.

It is important to emphasize that the invention of the personal computer came from outside, not just bypassing the great industrial manufacturers, but in opposition to them. That unpredictable innovation transformed informatics into a mass medium for creation, communication, and simulation. There is no stable identity in informatics because computers are networks of interfaces open to new connections; these are unpredictable, and can radically transform their meaning and use.

For Lévy, digital codification is already a principle of interface. We compose images, texts, and sounds with elements into which we incorporate our thoughts or senses. An image or sound can become a point of support for new intellectual technologies; once digitalized, it can be decomposed, recomposed, indexed, and ordered within multimedia hyper documents. Such media can potentially be manipulated with the same facility that writing today can be edited.

At the heart of social media, it is possible to highlight four functions that will replace the old distinctions based on the press, radio, television, and telephone; they are: 1) The production or composition of data from software or audio-visual representations; 2) The selection, reception and treatment of data, sounds, and images; 3) Transmission through the digital network; 4) The functions of storage (Lévy, 1993) . Along with these functions, a new hyper textual form of

writing is now possible, one that will be closer to the setting for a spectacle than to the classic writing, in which the author is mainly worried about the coherence of a linear and static text.

Lévy (1993) points out that future authors will have the task of inventing new discursive structures, discovering the still unknown rhetoric of dynamic schemes, variable geometric texts, and animated images, where colors, sound, and movement will associate to signify. The context of the new intellectual technologies will be similar to that of the great printers of the 16th century, who were at once literates, humanists, technicians, and explorers of a new mode of organizing knowledge. The quantity of digital data available is constantly growing; the more it grows, the faster we must work to structure it and map it. In addition, the interfaces for finding and using data should be improved.

Lévy (1993) highlights the importance of the notion of real time, created by informatics technicians, which captures the spirit of informatics: a condensation in the present and ongoing operations. However, dynamic writings (hypertexts, multimedia compositions, and groupware) could reintroduce certain forms of historical distance and hermeneutic work within the task of interconnecting in real time, which is intrinsic to informatics.

Another issue that Lévy (1993) points out is that, in the case of informatics intellectual technologies, memory is so externalized and accessible that it raises the question of whether traditional notions of memory are still pertinent. Memory, by being computerized, is objectified to such an extent that the truth is no longer a fundamental issue, in comparison with operability and the speed of locating information. In written civilization, books and theory remained at the horizon of knowledge, offering stability and uniform belief in the true theory or the right explanation. Today's people would be alarmed at adopting even partial identification with a single theory. Instead, knowledge is in a permanent and vertiginous metamorphosis; theories give ground to models that are not written on paper, but created on a computer and amplified across a network.

For Lévy, the digital model is not read or interpreted as a classical text; it is generally explored interactively. It is plastic and dynamic, with a certain autonomy of action and reaction; it is knowledge produced by simulation. The manipulation of parameters and the simulation of all circumstances give the software user a kind of intuition about the cause and effect relationships in the model. In cognitive terms, one acquires knowledge by simulating a modeled system, which resembles neither theoretical knowledge, nor practical experience, nor the accumulation of an oral tradition. Cognitive psychologists have hypothesized that everyday human reasoning has little connection to the application of rules in formal logic. It is more plausible to argue that people build mental models of situations involving the objects they are reasoning about, and afterwards explore different possibilities using those imaginary constructions. Thus, simulation through models can be considered a form of computer-aided imagination. At the same time, it is a much more powerful tool to aid reasoning than formal logic, which is based on the alphabet. Simulation (imagination, mental bricolage, attempts, and mistakes) corresponds to the step in intellectual activity that precedes rational exposure through a theory, which is a more formal approach to presenting knowledge. From the dynamic understanding of intellectual technologies, it is possible to deepen the concept of cyberspace, which is a driving element of cyberculture, because it has been established in the context of informatics intellectual technologies.

For Lévy (1999) cyberspace is not only the material infrastructure of digital communication, but also the universe of information it shelters and the human beings who co-inhabit and amplify that universe. In his vision, Lévy does not separate the technical and human aspects of cyberspace; on the contrary, he treats them as a single element. This universe should be understood as an interactive, community communication device, which encompasses every advantage and resource of the informatics intellectual technologies previously discussed. In cyberspace, the computer is not a center, but a knot or component of the calculating universal network. Thus, contemporary informatics is deconstructing the computer in favor of a transparent and navigable communication space, where every function is distributable and increasingly distributed. In this sense, cyberspace is becoming a privileged instrument of collective intelligence.

Intellectual technologies related to informatics and cyberspace power the essential concept of cyberculture that Lévy (1999) characterizes as universal without totality. Cyberspace is universal because it enables any person in the world, regardless of time and space, to create a part of it—it has no center or guidelines. It accepts everyone, because it is content to connect any given point with any other, regardless of the meaning of the related entities. It is without totality, because an undetermined universe that tends to keep it indeterminate. Each new knot in the network of networks in constant expansion can become the producer of new and unpredictable information, and can thus itself reorganize a part of global connectivity. In addition to the idea of being universal without totality, another fundamental way of understanding cyberculture is to think of virtualization as a potential state of things.

Virtuality constitutes the distinctive trait of the new face of information provided through informatics and cyberspace digital technologies. Lévy (1996) affirms that digitalization is the technical basis of virtuality. It not only affects information and communication, but also bodies, the economy, sensitivity, and the exercise of intelligence (through virtual communities, virtual companies, and virtual democracy). Although cyberspace as a technical infrastructure has an important role to play in that process, it is a phenomenon that far surpasses informatization.

The word "virtual" is often used to mean that which does not exist, generating an erroneous and dichotomist vision that separates the virtual from the real. In that vision, "real" presupposes a material effectuation, a tangible presence, while "virtual" signifies the pure and simple absence of existence—an illusion. Such an understanding presumes that everything is either real or virtual, because it is not possible to have both properties at once.

Lévy (1996) demonstrates that, in the philosophical conception, a virtual thing exists only potentially and not in an act; it is not the opposite of "real", but of "actual". Virtuality and actuality are two different modes of reality. The tree, for instance, is virtually present in the seed; therefore, the virtuality of that tree is very real (without being actual). Lévy (1996) affirms that every deterritorialized entity is virtual and capable of generating several concrete manifestations in different distinct moments and places, without being stuck in any particular place or time. A single word, for example, is a virtual entity—it is always being spoken in one place or another, at a certain day or time. When we use the word in a specific situation, we are performing an actualization, which is a process of resolving that situation; the word itself is not anywhere and is not connected to any particular moment.

Actualization appears for Lévy (1996) as a momentary situation to resolve a problem; it is the creation or invention of a form from a dynamic configuration of forces and purposes. Virtualization is the inverse of actualization—not a derealization, but a mutation of identity. In other words, the entity starts to find its essential consistency in a problematic field. Thus, virtualizing an entity involves discovering a general issue that it relates to, and making the entity mutate towards that question. The process of actualization moves from a problem to a solution, while virtualization moves from one given solution to (another) problem. Thus, virtualization is one of the main vectors of reality creation.

The invention of new speeds is the first degree of virtualization. Lévy (1996) reports that the acceleration in communications is contemporaneous with an enormous growth in physical mobility, paralleling the wave of virtualization. Another characteristic of the virtual is the so called Moebius effect, through which the interior changes to the exterior and the exterior to the interior, for example, in the relationship between private and public, proper and common, map and territory, author and reader. Clear borders give way to a fractalization of repartitions, with the passage to the problematics, displacement of being into the issue. It is something that questions classic identity and thought based on definitions, determinations, inclusions, and exclusions. This is why virtualization is always a process of welcoming change.

Lévy (1996) highlights three concrete cases: the virtualization of body, text, and economy. In this text, we have chosen to analyze thoroughly the first two examples, body and text, as these are more closely related to the complexities most likely to affect education.

One way of thinking about the virtualization of the body is that we can be—at the same time—here and there, through techniques of communication and telepresence. Another concept is that we virtualize the body medically, using equipment of medical visualization that makes our organic interiority transparent, while grafts and prostheses mix one body with the bodies of other people and with artifacts.
Lévy (1996) affirms that, as with knowledge and the economy, the virtualization of our bodies has introduced a new step in the adventure of self-creation that supports our species. Our perception, for example, which helps to bring the world to wherever we are, has been externalized by systems of telecommunications. The telephone for hearing, television for seeing, tele-manipulations for touching, and sensorimotor interactions are all devices that virtualize our senses. Virtual reality systems allow us to experience another person's complete sensorial experience, regardless of where we are.

In considering the virtualization of text, it is important to analyze the characteristics of hypertext, which is the text that emerges from the symbiosis with informatics intellectual technologies and networks. Lévy (1999) affirms that

hypertext is the opposite of linear text. As a structured text in a network, it represents a new art of editing and documentation. In conventional writing, the initial text is already there and complete. By contrast, hypertext is a matrix of potential (possible) texts, some of which will be realized only during interactions with the user.

Lévy (1999) argues that the virtual nature of a piece of text only occurs when human subjectivity enters the circuit, giving the text an indeterminate meaning and the propensity to signify, a tension that an actualization (interpretation) can resolve through reading.

The hypertext that is accessible through a network of computers is a powerful instrument of collective writing-reading, according to Lévy (1999) . It becomes important, because its digitalization and new forms of presentation give us access to other ways of reading and understanding. Thus, if the computer is considered a tool for producing classical texts, it will be nothing more than a practical instrument. If we consider the group of all texts that the reader can automatically release using one computer and a digital network, we enter a new universe of creation and symbol reading.

For Lévy (1996) , the use of informatics to produce hypertexts brings about cultural change, allowing the rise of new genres connected to interactivity. Hypertexts with digital support allow new kinds of collective readings (and writings), embodying a change from an individual reading of a precise text to navigation in wide digital networks, where a great number of people annotate, increase, and connect texts with one another.

This new kind of text objectifies, operationalizes, and amplifies the power of the collective and the crossed identification of the reader and the author. In this context, every reading becomes an act of writing. Hypertexts in digital networks do not have clear borders; there is no longer a discernible and individualizable text—the hypertext is a text that is closer to the movement of thinking.

Thus, Lévy (1996) argues that the use of dynamic supports for informatics can encourage the invention of new writing systems to better explore the new potentialities of digital hypertext. We are in the era of writing digitalized, fluid, reconfigurable text, in a non-linear way; each participant is a potential author. Thus, far from annihilating the text, virtualization allows new forms of writing and reading. It is practically a newly invented form of writing that is just starting to present traits of orality.

IV. CONCLUSIONS

By analyzing cyberculture and its own relationship with institutions, especially educational ones, we can come up with the following questions: Are educational institutions prepared to welcome and address the new issues that cyberculture has created? Are schools organized to observe the principle of the universal without the totality of cyberspace?

Those questions reveal that most educational institutions, most of the time, are not prepared or structured to handle most of the complexities of cyberculture. One possible reason is that most have been trained to teach intellectual writing technologies, which have existed for centuries. These are completely different from informatics technologies.

In addition, it is necessary to understand cyberculture—not just from the perspective of authors like Pierre Lévy, who defend a relatively optimistic view of contemporary society—but so that education professionals can improve their work as educators, We must analyze all aspects of cyberculture within the larger and more critical context of contemporary society. In other words, we must question ourselves to discover whether society is really improving people's life conditions.

To sum up, we conclude that the complexities should be further studied and analyzed so that cyberculture can be better understood. Analyzing the work of thinkers like Pierre Lévy is an important step in that direction. Such an understanding makes it possible to reward institutions, while exploring the most positive potentialities of informatics intellectual technologies, cyberspace, and cyberculture.

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