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ORIGINAL ARTICLE



THE NEW INFORMATION AND COMMUNICATION **TECHNOLOGIES: FROM THE CAVE TO THE NEW TECHNOLOGICAL PARADIGMS**

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Abstract:

This paper presents a brief literature review on human language as a differentiation and evolution object of other species within a historical context that is intertwined with the humanity history. Then we will treat the technological evolution of communication tools created by the man who drove the knowledge transfer mode and form, leading to consolidation of the great nowadays achievements, where we can take the internet as an example. The concepts of cyber culture and cyberspace were appointed at the light of the theoretical Pierre Lévy, Manuel Castells, as well as manifestation and architecture of the online social networks phenomenon, where we also see a rediscovery and reinterpretation of identity and identification foundations inserted in this new context, because these authors researches present important reflections for a more holistic understanding of these topics. We also revisited the initial networks concepts reaching the digital social networks as a new form of interaction for socialization of the network society. Finally, we considered a fitted look on the new technologies influence in education, society and work and tried to explain the advantages of disadvantages that conquered in this way taken by humanity up to the present days and make the readers to awaken their consciousness about the concepts discussed in order to contribute in their individual reflections and conclusions.

KEYWORDS:

Language; Communication; New Technologies.

INTRODUCTION

1.INITIAL CONSIDERATIONS

The human language as a differentiation and evolution object in relation to other species, within a historical context that is intertwined with the own humanity history. For a broad understanding about information and communication technology we report our look at the knowledge stages layout.

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Plato in his book "The Republic" presents us the following question:

[...] suppose some men in an underground cave-shaped housing, with an entrance for light, which extends through the entire length of this cave entrance. They are there since childhood, cuffed legs and necks, in such a way they can only remain in the same place and look ahead; they are unable to turn their head, because of the shackles; serves them as light a fire burning in the distance, in an eminence, behind them, between the fire and the prisoners there is an ascendant way, along which was built a small wall, in sidings genre that men put in front of the public, to show their skills over them. - I see - he said.

- Also view along this wall, men carrying all sorts of objects, that go beyond: men and animals statues, made of stone and wood, all kinds lavor, as it natural, of those who transport, some speak, others follow silent (Plato, The Republic, Book VII, p. 315).

The above text presents "The Cave Myth", which translates how individuals can only believe in reality presented to them, in this case, through the cave wall illuminated by a campfire and that formed different images by shadows, however, an individual had the opportunity to go out, discovered the real world with living beings and nature. So when returns to the cave and describes everything he had seen and learned, he was called crazy and even threatened with death if he did not stop to talk about those considered absurd ideas.

In their study "Enlightenment Dialectic", Adorno and Horkheimer (1996) use a term that marks the "disenchantment world" process, where individuals are freed from the unknown fear, which was taken to explain the unexplainable and meet the needs of unanswered questions.

With man cognitive achievements advancement, according to Cagliari (1993) writing history is divided into three stages: pictorial, ideographic and alphabetical. The pictorial stage is characterized by a very simplified representation creation of reality objects. Whereas in ideographic, there are special drawings called ideograms, which with man natural evolution were stopping to represent portrayed figures and started to have the status of a simple written agreement. With the letters of our alphabet, it was a matter of time in this evolution context, because when the ideogram lost its pictorial value, it began to conceive the role of phonetic representation, then it is marked alphabetic phase, where letters take on the lead role.

The first material were used to spell were rocks. Spalding (2011) says that writing was essential to memory and to store knowledge that could not be lost. The Hammurabi Code, dated at the eighteenth century BC is a monolithic monument carved in diorite rock, which presents the laws and punishments that governed the Sumerians in ancient Mesopotamia.



Figure 1 – Rock with Hammurabi Code and Code Detail Source: SPALDING (2011).

Other important code written on rocks was the Ten Commandments that Moses received from the Lord as quotes a biblical passage.

Attending divine command, Moses goes up to Sinai Mount, where he stays for 40 days and 40 nights. The wait is long, not because reading and writing are itself time-consuming practices, but because

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on the boards that are given to Moses, there are registers, in detail, of God's people social and personal lives regulatory rules. The episode has a lot of power, because it stages writing full manifestation as social live regulatory mechanism, a task that it already had since Hammurabi Code, applied in Babylon probably from the eighteenth century BC. And continues this assignment up to today in East and West, North and South of the planet, through religious books and the established states entire legal apparatus, the labor contracts constitutions and personal documents. If, on its part, the Hammurabi Code is a historical and dated instrument, the document handed to Moses by divinity rises the regulator gesture to mythical plan. (LAJOLO & ZILBERMAN, 2009, p. 161)

With these two codes written on rocks having their recognized historical significance, writing would only become a humanity mark if there were mobility and easy handling.

Darnton (2010) reminds us that Johannes Gutenberg is considered the press inventor, but he is not this technology inventor, because today we know that the Chinese had produced movable types around 1,045, however Gutenberg's invention that dominated this scenario. The Bible was the first book printed by Gutenberg and had 1,282 pages; probably 180 copies between 1,452 and 1,455 had been printed.



Figure 2 – Gutenberg Bible Copy Source: SPALDING (2011).

Two events would revolutionize this historical moment, the reading form and a great book popularization as had never been seen, in the words of Darnton (2010) "removing books from Church monopoly."

From mobility achievement and easy writing reproduction, Souza (2003) describes various technological artifacts invention and improvement that mark inflection points in the way of communication starting with the newspaper in the 1,600s. It Comes soon after in 1850 the telegraph, and the telephone in 1920. From that moment we see the radio in 1930, to reach a distant public, and the television in 1950 marked its time with the images and schedule different from everything seen so far. The year 1990 presents the Internet as something totally new and with endless possibilities.

2. THE INTERNET: GENESIS AND EVOLUTION

The Internet history in Brazil, according to Vieira (2003) in his study "Internet backstage in Brazil", dates back to 1988 when São Paulo Research Support Foundation (FAPESP), in partnership with the Fermi lab, made \Box the first connection to the network and the first packages transmitted was related to electronic mail.

In Vieira's (2003) notes, the invention that enabled the Internet use was created by the English physicist, Tim Berners-Lee, in 1990 at CERN, in Switzerland, which consisted of hypertext technology, that attached a link between various texts and files, allowing its access from any computer connected to the Internet. The documents were then given an address, called Uniform Resource Locator, or URL, which was

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consisted of one hypertext, better known as Hypertext Transfer Protocol (Hypertext Transfer Protocol), indicating its availability on the Web (known as name).

Em sua linha do tempo Vieira (2003) marca que pouco depois de 1993 entrou em cena um software que tornou possível a navegação em páginas como temos na atualidade, conhecido como browser, cujo nome era Mosaic que foi criado por Marc Andreesen. Esse novo programa permitiu superar as limitações de formatação de texto em letrinhas verdes evoluindo para as interfaces gráficas, ou seja, uma cara nova, que propiciou a interação com imagens, sons, vídeos e gráficos em espaços que possibilitavam atualizações dinâmicas e rápidas, denominados sites. Esse foi o ponto marcante para que a expansão da rede mundial de computadores alcançasse o status atual com implicações no comércio, educação, pesquisa, sociedade e no mundo do trabalho que os mais otimistas vislumbraram.

In his timeline, Vieira (2003) registers that shortly after 1993, a software came on the scene that made \Box it possible the pages navigation as we have today, known as Web browser, that name was Mosaic, which was created by Marc Andreessen. This new program permitted to overcome the text formatting limitations in green little letters evolving for graphical interfaces, that is, a new face, which provided interacting with images, sounds, videos and graphics on spaces that allowed dynamic and fast updates, called sites. That was the striking point for World Wide Web expansion reach the current status with implications on market, education, research, society and the work world that the more optimistic envisioned.

The trade and easy access Internet had as starting point the year 1995 and in Brazil had its beginning marked by the appearance of hundreds of small network access providers. The computers sale had surpassed television sets and telephone lines consumption, that gradually increased, until the explosion observed after privatization in 1998 (VIEIRA, 2003, p. 16).

Another important historical fact pointed out by this author as Brazil's Internet consolidation was the creation of online Income Tax declaration.

In 1997, another technological mark of income tax: the Internet delivery. To further facilitate compliance with accessory tax obligations, a specific program was created to transmit declarations, Receitanet. The taxpayer could already complete and submit an annual declaration without needing to go to an authorized bank or a FRS unit. It was enough to "download" from Internet and the PIT programs and Receitanet to be able to complete and submit a declaration without leaving home. The Federal Revenue Service had previously done an experiment in allowing delivery through Internet, but with limitations. The greater coverage occurred in 1997, with the advent of Receitanet.

http://www.receita.fazenda.gov.br/Memoria/irpf/historia/hist1997a2006.asp#entregaDeclaracao Accessed on jul 10th, 2013.

In the latest survey conducted by IBGE (Geography and Statistics Brazilian Institute) in 2005, shows that the population total aged over ten years that accesses the Internet through a personal computer with a certain goal, it is clear the internet penetration in lots of segments in Brazilian society, as can be seen in Figure 3.



Fonte: IBGE, Diretoria de Pesquisas, Coordenação de Trabalho e Rendimento, Pesquisa Nacional por Amostra de Domicílios 2005.

Figure 3: Internet access by grouping activity Source: IBGE, 2005

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3.CYBERSPACE AND CYBERCULTURE CONCEPT

The canonical communication model, also known as cybernetic model, has as its main precursor, the mathematician, Norbert Wiener who in 1948 published the book "Cybernetics", which sowed the basis for conception biological or mechanical live organisms and the information notion. After, this study has inspired countless filmmakers in science fiction works, but he also threw in this study the basis both for computer science development as awakened to realize the interdisciplinarity importance. Cybernetics means according to this author "the art of governing" (from Greek kybernetiké, pilot), which during the II World War had his studies on missile guidance and autopilot aircraft.

The primacy on quoting the cyberspace term is attributed to Gibson (1984) in his book Neuromancer, that shows an abstract world with real world representations and where computing and technological resources provide to the mind a fluid trip and continues to where it wants.

Using more current theoretical, Lévy (1999) reports on non-physical artificiality, that is, virtual spaces that concentrate large individuals amount connected by common or unimportant interests.

While Castells (2001), says that cyberspace is a new space, known as the World Wide Web.

It is clear the knowledge about resources use by primitive man in order to gather and preserve knowledge, experiences and ideas that formed his culture, that is, how he identified the environment and himself with other individuals.

To clarify this issue, Santos (2002, p.50) states, "culture is the society dimension that includes all the knowledge in a broad sense and all the ways in which this knowledge is expressed. It is a dynamic dimension, creative, a process itself, a fundamental dimension of contemporary societies."

The network society generates Cyberculture as a space within this communication place through computers. Paraphrasing Capobianco (2010) the technological advances are absorbed by distinct social sectors that consolidate Cyberculture, it also requires a new format for labor, education, entertainment and communication relations between people.

In Eugenio Trivinhos understanding about Cyberculture, the author presents us the following definition:

Cyberculture means human life material, symbolic and imaginary configuration, corresponding to worldwide prevalence of technologies and advanced digital networks, in labor sphere, free time and leisure. (TRIVINHOS, 2007, p.116).

To understanding enhance of what Cyberculture means, Souza (2009) says that this is formed by customs and knowledge set added to implanted technological device, however, they are still referenced in traditional customs and practices. In this context, Internet presents itself as the biggest Cyberculture exponent.

4.THE DIGITAL SOCIAL NETWORKS

Taking as its starting point the classical antiquity we have the networks concept that Meffesoli (1998) points as the individuals social aggregation into a tribes metaphor.

The mathematician Leonard Euler since 1736 began his networks study and led its designation as a graph and expands as study object in graphs theory created by this author, where a graph would be formed from the encountered problem when passing by all seven bridges in Königsberg city, only once, as Figure 4 shows.

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Figure 4 – Könisberg Bridges Graph Source: Recuero(2009)

According to Castells (1999), network is the elements formation, better known as knots, interconnected by edges, which applied to the information society represent structures capable of unlimited expansion.

(...) The distance (or interaction intensity and frequency) between two points (or social positions) is less (or more frequent, more intense) if both points form a network knot that does not belong to the same network. (...) The inclusion / exclusion in networks and the relation between networks architecture, enabled by information technologies that operate at light speed, configure processes and functions prevalent in our societies. (CASTELLS, 1999, p.498).

In Recuero's (2009) social networks studies, these are formed when an individuals' group connects itself through computer-mediated communication. With computer networks and mobile spread, more people relate through the Internet, then Primo (2007), helps us to understand this phenomenon that is established through mutual and reactive interactions, that Recuero (2003) attributes the belonging feeling to the many connections between virtual communities attenders.

According to Mattos; Souza (2012) these individuals characteristics and common interests show sociability and an interests connection a question of social aggregation formation in digital media.

5. IDENTITY AND INDIVIDUAL IDENTITY IN DIGITAL SOCIAL NETWORKS

With individuals on the internet increasing expansion, it is necessary to ask how these connected individuals "transport" themselves to this universe that allows them diverse roles, which according to Baudrillard (1999) Internet represents a freedom and discovery space.

According to Levy (1996), virtual is not opposed to real, but rather as a real life extension or continuation in a virtual life. Opposing this understanding in Prensky's (2001) conceptualization on "Digital Natives" and "Digital Immigrants", a question arises, how these individuals are identified

To Meffesoli (1998), the multiple identities are formed by new symbols, images and objects that add new social interaction forms. And Castells (1999) corroborates saying that Internet itself has created a "real virtuality culture." This is because the social relations based on digital networks have technological support to stand many communication possibilities.

From Mattos and Souza's (2012) light, identification is an individual record formalization, that is, the various possibilities of linking the individual to codes, images and references that report the desired person.

Thus, it is observed that according to the searched theoretical identity and identification are distinct concepts. The identity in digital media suffers constant modification following virtual environment interests and intentions in which the individual intends to live with or that is inserted time at work time at leisure.

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6.NEW TECHNOLOGIES AND NEW SOCIETY IN EDUCATION AND WORKS

Souza's (2009) studies reveal profound changes in a new society formation, which facing more violence, seeks isolation, security and tranquility. The increase in workload is an accomplished fact to maintain a reasonable living and comfort standard. Noting waste of time in traffic to get to work has changed the lives in great urban centers.

Paraphrasing Souza (2009), there are many variables that lead the individual to get isolated and choose a way of communication with the outside world that computer and internet provide, opening new ways for new work, study and leisure forms. This author reports that:

With so many changes in modern society, brought by Cyberculture, we infer that we are facing a new space social production form, in which instant real-time is a timeless time and new day-to-day has no space and matter. The image-flow, presentification, virtual reality and the various communication possibilities in cyberspace suggest a new environment: digital cities. The virtual reality that appears in cyberspace is not only sensory contemplation result of images and information exchange, but also an objective way to be social arrangement new materiality in communication networks. (SOUZA; GOMES, 2009, p.11).

Education has a key role in this transformation. The notes on new technologies use in education have been applicant and reminding Moran (2004, p.46) in his quote "multiple (...) are the possibilities of using new technologies for education."

Another important point is the proper use of these technologies, for doing so anyway just makes difficult the change process, leaving a bad impression and creating more resistance to the new. According to Levy (1999),

It is not about using technology at any cost, but accompany consciously and deliberately to a civilization change that profoundly questions the institutional forms, the mentality and culture of traditional educational systems and in particular teacher and student roles. (LÉVY, 1999, p.163).

All who make education need that consciousness and experience this new way of doing things promoting the transformation to a knowledge society.

7.FINAL CONSIDERATIONS

Man's need to communicate, since the beginning fueled the search and development of the most different formats means, from writing to the computer. So it would be very reductive to consider information and communication technologies use only in educational field, because we believe that its scope reaches the work, recreation world, and so on.

Every literature review work sought major theorists within their research areas, and reported their contributions to scientific knowledge. Clearly, information and communication new Technologies complexity allied to individuals 'primitive needs to communicate and transmit knowledge finds a convergence between old ways of making a new way to perform and live, where each new technology rise and consolidation contributed to a moment of profound society transformation.

It is known that these new technologies have changed the way of life as well as their presence is increasingly more present and striking, producing a rating of two individuals large groups, which according to technological change period can be classified as digital Natives or Immigrants.

For education is set the challenge of working with the man/machine interaction, as subject and object at the same time. We can no longer think on Cartesian way and separate technical things, putting them on one side and the man on the other side, his language, his symbols, his culture. In the network society and in the knowledge era everything is connected and it is very fast, however it is necessary to conduct this process with organization and efficiency to build this new society model.

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