

3 Beyond the "impact" metaphor: The mutual shaping of psychological theory and Internet development

Giuseppe MANTOVANI

Abstract. Studies aiming at identifying the social effects of the Internet usually assume that technology exerts a causal, unidirectional and deterministic action on individuals, groups, and organizations. This conception, embodied in the metaphor of the "impact" of technology on society, is rejected by research on Science, Technology, and Society (STS) and by cultural psychology, which see in the Internet an artifact that shapes social processes and at the same time is shaped by them. The Internet is constructed through its current use which is shaped by current psychological theories and - vice versa - the spread of the Internet creates new environments which call for development of new psychological theories of both cognition and communication. From a cognitive perspective the Internet is above all a huge reservoir of data for *information foraging*. From a social perspective it is an environment for the setting up of online societies, a space for *social gathering*. Lastly, the Internet is, within the cultural psychology perspective, a *new artifact*, a communication medium still being built. The cultural conception does not expect that the Internet may produce uniformed and generalized *effects* in the various social contexts, but rather it maintains that the Internet carries out its mediation function in differentiated ways, according to the interests of the communities using it, to the different ongoing situations, and to the different visions of the social function of the Web. Artifacts are embodied social projects: important political choices about the Internet may be embedded in apparently esoteric technical matters such as the design of search engines. At present the original vision of the Internet as a public space, a popular medium granting equal access to all people, is challenged by current practice which builds the Internet as a market in which top visibility is conquered by powerful individuals, groups and organizations.

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3.1 The “impact” of the Internet: a misleading metaphor

Psychological research studies on the social *effects* of the Internet are very topical. This is quite understandable if we consider the diffusion rate of the Internet and the economic and cultural importance it has come to have in advanced societies. Unfortunately, research results are often discrepant and puzzling both to researchers and the public at large who would like to know whether the Internet is “good” or “bad” for them, and in what sense.

Result discrepancy is not in itself a bad thing: it may be due to the fact that different research studies highlight in turn different aspects of a change process which is multifaceted both from the technical and social perspective. If this were the case, we would now be witnessing a first, and necessarily tentative, mapping of the *effects* of the current technological innovation which would have to give way to a unitary view as the single pieces of the puzzle fall into place. Actually, the problem we are facing has originated from the fact that the research on the social effects of the Internet starts from a wrong premise, i.e. the assumption that technology is detached from the social reality that produces it and that it can generate social changes by itself.

The idea that “technology” changes “society” is advocated by computer firms’ advertising initiatives, by several technical-scientific works, and by publications of well known scientists [1] supporting technological utopianism [2, 3]. In favor of this hypothesis – incorporated in the ubiquitous metaphor of the “impact” technologies have on social reality – are its seeming simplicity, the huge persuasion power of the political and economic forces that want to identify technological innovation with social progress *tout court*, and the fact that it “echoes the naive technological determinism which is a standard pattern of American discourse” [4]. Research on Science, Technology, and Society (STS) has shown the falseness of the assumption according to which technologies would be separated from social processes and cause social changes per se. A number of field research studies have rejected as unfounded the society-technology dualism, showing how technological innovation originates within the social context which guides its invention and shapes its use [5-10]. Notwithstanding its groundlessness, the idea that computer technologies produce social *effects* is so widespread that we, too, had to use the term social *effects* of the Internet to get our purpose across.

The “impact” metaphor originates a problem space where a separate entity, be it the Internet or “technology” in general, hits an external entity, “society” in its various parts. It is worth noting that the “impact” metaphor has a strongly aggressive connotation as it indicates the action of a missile coming into contact with its target. It conveys the idea that the Internet changes social processes at various levels: micro (individuals), meso (groups) and macro (organizations and institutions). With reference to the debate on the *slums* within the USA social policy of the Seventies, Schön [11] has shown that metaphors generate a problem-setting which strongly affects the ensuing problem-solving. If slums are infected *bubos* that might contaminate the whole city, then they must be removed and rebuilt; if, on the contrary, they are *poor communities*, then the most plausible solutions will be those oriented toward offering residents social support to improve their conditions.

The first metaphor, the plague, calls for bulldozers; the second, the community in distress, calls for social workers. The former sees the problem in terms of surgical interventions to defeat the infection and relocate the residents, the latter sees a problem made up of disadvantaged individuals and communities in distress. The impact metaphor assumes a causality, both unidirectional, i.e. technology would influence society without the converse taking place, and deterministic, i.e. a given technology would produce specific social *effects*.

This conception of the relationships between technology and society, which we have called “technological determinism” [12, 13], is with few exceptions [14-18] – accepted

as the undisputed framework in the studies on the *social effects* of the Internet. Sproull & Kiesler [19] find that the Internet has the *effect* of promoting democracy in organizations because it makes information available to everyone and speaks up for those who cannot. Rice's [20] research study highlights an opposite *effect*: the Internet increases status and power differences within organizations. Stoll [21] claims that the Internet favors social isolation by moving people from their "real" communities. Turkle [22-24], albeit with some reservation, maintains the opposite: in Multi-user Dungeons (MUDs; they are textual virtual environments shared by many participants at the same time), people experience new forms of communication and identity, even if anonymity and the possibility of concealing the participants' "real" identity can have bewildering effects. The extensive literature on the supposed *social effects* of the Internet shows that while the nature of the *effects* is controversial, the idea that the Internet has per se *social effects* is almost universally accepted.

A recent case is represented by Kraut et al.'s [25] paper devoted to the paradox of a "social technology that reduces social involvement". Although the authors make it clear that "arguments based on the attributes of the technology alone do not resolve this debate" because "people can use home computers and the Internet in many different ways and for many purposes, including entertainment, education, information retrieval, and communication" (p. 1017), the aim is to identify the *consequences* of the use of the Internet. "The findings of this research provide a surprisingly consistent picture of the consequences of using the Internet" (p. 1028). The consequences highlighted by the research study – decline in social involvement, increase in loneliness, increase in depression – allow the authors to conclude that "using the Internet adversely affects social involvement and psychological well-being" (p. 1028). The conclusions of Kraut et al.'s study had ample national media coverage and triggered off lively discussions. However, the idea that the Internet as such had specific social effects was not generally questioned.

3.2 The Internet: an artifact under construction

A recent exception to the general acceptance of the "impact" metaphor is McKenna and Bargh's [26] study in which they maintain that "*the Internet by itself is not a main effect cause of anything*, and that psychology must move beyond this notion to an informed analysis of how social identity, social interaction, and relationship formation may be different on the Internet than in real life" (p. 57; the italic is ours). Their study, however, has the limitation of ignoring the cultural dimension of artifacts, as is apparent by the fact that McKenna and Bargh distinguish the processes that take place on the Internet from those that take place in the "real" world, as if the Internet did not belong to the "real" world in the same way the telephone, the radio and the car belong to it. Human environments are always interwoven with artifacts and it is not possible to separate, within the human experience, "natural" and "artificial" contexts: even natural parks are social products, the result of shared sets of values, political decisions, and legislative measures.

In our everyday experience we do not deal with separate worlds – one of face-to-face relationships, another of telephone relationships, another of Internet relationships and so on – but with a single world in which our is always mediated by cultural artifacts [27, 28]. Culture enables the members of a given community to successfully interact with the environment and with the other community members by means of physical and conceptual artifacts – among which language has a privileged place – that allow to attribute a shared meaning to actions and situations [29, 30]. The artifacts present in the environment can be either physical instruments, such as the Internet or the telephone, or conceptual instruments, such as the categories that organize face-to-face interactions. Also in the latter case the relationship is mediated by artifacts, only in this instance it goes through

immaterial artifacts, such as the preference systems and the values typical of a given culture, which make the interlocutor in turn attractive or unpleasant, interesting or boring, reliable or unreliable.

McKenna and Bargh basically ignore the role of cultural mediation: they think that "key situation variables that make the Internet a unique and special social domain: anonymity, the mitigation of physical proximity, and physical attractiveness as gating features to relationship formation, and the enhanced personal control over the time and pacing of interpersonal interactions" (p. 72) interact without mediation with individuals' interests and goals. The direct interaction between the Internet and the people who use it would be, according to McKenna and Bargh, the actual object of the social studies on the Internet which "will be most profitably directed toward identifying the critical individual differences that will mediate and moderate the Internet's powerful situational forces to determine whether the effect on the self, social identity, relationship formation and maintenance, social interactions, organizational functioning, and mental health will be positive and fulfilling or negative and destructive" (p. 72). In their paper McKenna and Bargh conclude that the Internet is a medium like others that have been developed before, and that, as already occurred in the past, it will be individuals who will decide its destiny: "Like the communication advances before it, the Internet will always and only be what individuals make of it" (p. 72).

McKenna and Bargh's neglect of the historical-cultural dimension is the reason why they fail to grasp the two main issues that the development of the Internet presents to the psychologist: on the one hand that of understanding the specific characteristics, and specific potential, of the Internet as the product of history and of a peculiar scientific and technological community [31]; on the other, that of understanding individuals' behaviors within the functioning of the communities (business, school, family, etc.) to which they belong. Unlike McKenna and Bargh, in the Internet we see a new artifact, originated by a particular moment of history and full of potentialities which will be implemented and revealed in time by the different "communities of practices" that will use it [32, 33, 34]. It is these communities – who supply individuals with the reference frames necessary to communicate and collaborate, frames which individuals will continually change through their situated and inevitably creative activity [35] – who will teach people how to properly utilize a medium like the Internet which is already in all offices and in over 40% of American homes, but whose social meaning is still under construction.

Instead of asking only what effects the Internet has on social actors (individuals, groups, and organizations), we may ask what social actors are making of the Internet. People interact with the Internet not in an "immediate" way, but going through several instruments of mediation, both physical and conceptual. In particular, people perceive the characteristics of an artifact on the basis of social processes such as the shared experience acquired in using it, the building up of expectations, the definition of the proper and desirable ways to utilize the artifact [36]. The meaning of an artifact is built through its socially recognized use, stabilized across time: in the history of inventions a technological innovation has often come about not in a research laboratory but in the everyday context of its use, as Bijker [37] shows when studying the invention of fluorescent lighting. The outline of an artifact is defined in its actual use; the Internet is at present simply one of the names (together with others, such as "Cyberspace", "World Wide Web", "Advanced Information Technology", "Information Superhighways" etc.) which we use to designate that particular constellation of metaphors which define the many potentialities and the several current uses of an artifact still *under construction*.

What metaphors are we using to construct the Internet through its use? We use three types of metaphors, each of which reflects a particular way of interpreting the human experience developed by recent psychological research. First of all there are metaphors that see the

Internet as a space in which to gather information; these metaphors include within them the approach of the early cognitive psychology, which saw cognition as individual information processing (Human Information Processing, HIP; [38, 39]). Then there are metaphors that consider the Internet as a space for communication and social gathering; these metaphors develop a vision which is no longer only cognitive, but also "social" (in the limited sense of "interpersonal") of human experience [40-45]. Lastly, there are metaphors that consider the Internet as a new artifact, an environment in which existing "co can meet overcoming physical distances and new communities can form online; these metaphors use concepts coming from anthropological research, communication studies, and cultural psychology [46-50].

3.3 The Internet as a space for information seeking: the cognitive approach

The Internet is constructed – by the media, by those who take up web pages, by providers, by users – especially as a huge store of information. Bharat and Broder [51] estimate the development of the Internet in 400 million pages, with a growth rate of 7.5 pages a second. Since 1998 estimates have been revised several times to keep up with the enormous increase in the amount of information available on the Internet. The use of the Internet is mostly devoted to the exploitation of these huge mines of information: Bikson & Panis [52], basing their study on research carried out on a national scale in the USA, estimate that in accessing the Internet from their homes, 21% of the adults intend to consult databases (at work the percentage reaches 34%) to which is added another 15% of adults and 39% of young people who access the Internet to use educational programs. The tremendous growth of the information available has changed the way we consider information. While previously information was a scarce resource difficult to obtain, on the Internet we risk information overload. Critical human activities such as information seeking, gathering and consumption have changed deeply in the Internet era: "Providing people with access to more information is not the problem. Rather, the problem is one of maximizing the allocation of human attention to information that will be useful" [53], p. 643. The resource which is now becoming scarce is attention, not information. This paradox of the Internet seems unquestionable: a technology centered on information overturns the relationship between information and attention in favor of the latter.

To cope with the current situation, characterized by the overload of information with respect to human attention resources, an evolutionary ecological model has recently been presented – *the information foraging theory* [54] – which considers people's adaptation to the ongoing flux of information present in information-rich environments in the same way in which biologists study the adaptation of organisms to their physical environments. The merits and the faults of the *information foraging theory* are the same as those of the Internet in its cognitive-informational version. On the one hand, it has the merit to go beyond the old cognitive paradigm included in the Human Information Processing (HIP), both because it places information in the environment (understood in the evolutionary and adaptive sense) and because it attributes to the social actors capabilities of strategic initiative (*foraging* is a highly planned and at the same time highly situated activity) in which knowledge and action are closely interwoven. Information is no longer "supplied" but it is built by the actors through their activities of environment exploration. On the other hand, the *information foraging theory* inherits the more serious limitation of the HIP model, the neglect of communication, collaboration and culture. It does not see individual human beings as members of communities interacting with the environment through the mediation of artifacts. And yet, curiously enough, it is indeed an artifact – the Internet –

which has produced the situation of information over-abundance the theory intends to cope with.

Is the information available on the Internet truly available? Actually, human beings often cannot keep up with the exponential growth of the “available” information stored within the Internet. And so they resort to other artifacts. The problems which the Internet, as an artifact planned to hold exceptionally huge amount of information, gives human beings are partly solved by constructing other artifacts. A solution to exploit the deposits of data stored in the Internet – the metaphor used is *data mining* – goes through the construction of learning algorithms for discovering regularities in those databases which are intractable for human experts because of their hugeness, like, for example, the gigabytes of functional magnetic resonance imaging data describing brain activity in humans [55]. In this way -in general resorting to knowledge discovery techniques like those used for semiautomatic scientific discovery in Inductive Logic Programming (ILP) algorithms [56] - it becomes possible to explore masses of information that would otherwise be unmanageable by unassisted human beings.

3.4 The Internet as a space for social gathering: the interpersonal approach

The Internet is also constructed as a space for the coming together of people. “People on the net are not only solitary information processors but also social beings. They are not only looking for information; they are also looking for affiliation, support, and affirmation.

Thinking of people on the net as social actors evokes a metaphor of gathering. Behaviors appropriate at a gathering include chatting, discussing, arguing, and confiding” [57], p. 38. This approach captures much of what is currently happening in the net: according to Kling [58], 30% of home Internet use is spent in chat room discussions; USENET – a network of bilateral agreements among administrators of Bulletin Board Systems (BBS) – is supported by 16,000 organizations and has more than 2 million subscribers; in 1997 America Online had more than 350 organized clubs and forums and countless spontaneous interest groups; thousands of MUDs (Multi-user Dungeons) and MOOs (Muds Object-Oriented) allow people real time interaction in textual – and often also 3D – virtual spaces [59].

The social gathering metaphor shifts the focus of the Internet from individual information processing to social processes such as communication, discussion, and mutual narratives on the self. Communication is understood by this metaphor basically as an interaction between individuals: “If we view people as social actors, then we should view the net as a social technology. Any technology combines artifacts and procedures to apply knowledge for practical ends. A social technology does so to allow people with common interests to find each other, talk and listen, and sustain connections over time. Dinner parties, bowling teams, college reunions, coffeehouses, 12-step programs, neighborhood pubs - all are examples of social technologies” [60]. Interpersonal interaction in the Internet can stimulate personal reflection, disclosure, and investigation into personal and social identities: “Engagement with computational technologies facilitates a series of ‘second chances’ for adults to work and rework unresolved personal issues and, more generally, to think through questions about the nature of self, including questions about definitions of life, intentionality, and intelligence” [61].

One characteristic of communication in electronic environments is the possibility to experiment new forms of self presentations as happens in *gender swapping* (men presenting themselves as women and vice versa, and various combinations and shifts in using *handles*, as these provisional *personae* are sometimes called) widely used in MUDs and MOOs. What sort of communication environment is the Internet? Does it have special

characteristics, or it is just a new medium joining other existing communication media such as the telephone, fax, radio and TV? The sense that Computer-Mediated Communication (CMC) can change people's ways of thinking about communication emerged at the very beginning of the development of the Internet. Some characteristics of CMC are undisputable: it cancels physical distance among participants, makes physical location no longer important, removes indication of physical appearance making body presentation not focal. It also reduces costs, in terms of money and time, of sending mail, thus favoring information diffusion (and information overload). Other characteristics are open to debate, as we saw in the previous discussion of the studies of Kraut et al. [62] and McKenna and Bargh [63] on the social "effects" of the Internet.

CMC has been credited with encouraging people to express themselves more freely than in face-to-face social situations; the other side of the coin is the likelihood of rude and offensive behavior (*flaming*). The factors which stimulate the uninhibited style of communication sometimes surfacing in electronic environments are unclear. Sproull and Kiesler [64] think that lack of social context in electronic environments drives people to act more freely and even in impulsive and anti-normative ways: "People interacting on a computer are isolated from social cues and feel safe from surveillance and criticism" (pp. 48-49). This view was questioned on the basis of both field studies and theoretical concepts drawn from social psychology research, namely social identity theory [65], [66]: people sitting in front of a computer screen are not isolated from social context, claim Spears and Lea [67]. A person, even if physically removed from other people's presence, is not separated from the normative influence of her social group or groups (the group or groups with which she identifies). "Empirically, the assumption that CMC is characterized by a weakening of social norms seems to have little direct or independent support. In fact, it could be argued that an absence of social cues from other interacting individuals, together with the resulting uncertainty, forces people to resort to default social norms to guide their behaviour" [68], p. 286. Although default social norms shaping CMC may be even stronger and more inflexible than face-to-face negotiated norms, the idea that the Internet favors people's freedom of expressing themselves survives as it has deep roots in the history of the Internet [69].

3.5 The Internet as a new artifact: the cultural approach

A most suitable framework for understanding the relationships existing between the ongoing development of the Internet and the unfolding of human experience is offered by cultural psychology which sees the Internet as a new artifact, a new medium, a new communication environment. According to cultural psychology, all artifacts mediate between social actors (who are considered not as separate entities but as members of peculiar communities) and their environment. All artifacts, the Internet included, are *embodied social projects*: the dualism between technology and society does not have any space in the cultural model. "Cultural artifacts are simultaneously ideal (conceptual) and material. They are ideal in that they contain in coded form the interactions of which they were previously a part and which they mediate in the present. They are material in that they exist only insofar as they are embodied in material artifacts" [70]. Considering the Internet as an artifact means closing the gap between technology and agency.

An example of this approach can be found in Lemke's study [71] about the way in which an academic library redesigns its website and at the same time reorganizes its structure: "Our usual view of organizational communication and discourse places face-to-face encounters at the center of attention: people in meeting, agreeing and disagreeing. The corresponding analytical focus is generally on speakers and the thematic content of their

utterances. We do not usually foreground the *medium* of communication" (p. 21). New artifacts introduce new social games: in the library "a particular, novel discourse medium, the organization's website, seems to be playing a catalytic role in on-going processes of institutional change" (*ibidem*, p. 21). The question that cultural psychology deals with when it studies the Internet is this: which social processes is the Internet mediating in this particular situation? In which way are the replanning of the library and the redesign of its website connected? The cultural conception puts technology fully into the social and organizational games from which it originates and of which it is an important part.

Unlike previous artifacts, the Internet may bewilder us by challenging our current way of acknowledging reality and making necessary for us to invent new conceptual frameworks to make sense of the experiences we do in cyberspace [72-75]. We may be confused when having to make a decision about the meaning of experiences such as "playing doctor" in virtual reality: would we accept this experience as equal to that of being a doctor in "real" reality [76]? Artifacts always redesign the boundaries of what is or is not "real" [77], but new communication environments do it to a new extent. We are beginning to realize that the separation between "natural" and "artificial" environments is groundless. We understand now clearly that we inhabit a world which has always been both "natural" and "artificial": "Virtual reality is not 'real', but it has a relationship to the real. By being betwixt and between, it becomes a play space for thinking about the real world. It is an exemplary evocative object" [78]. Human experience is always mediated by artifacts and the Internet is only the latest step in the long history of human inventions. The problem of electronic communication is that it is still not smoothly integrated into our everyday routines: the domestication of the Internet is in progress and will require time.

In cyberspace situation ambiguity can grow to unprecedented heights: "Individuals find friends and groups find shared identities on-line, through the aggregated networks of relationships and commitments that make any community possible. But are relationships and commitments as we know them even possible in a place where identities are fluid? The physical world is a place where the identity and position of the people you communicate with are well known, fixed, and highly visual. In cyberspace, everything is in the dark. We can only exchange words with each other – no glances or shrugs or ironic smiles. Even the nuances of voice and intonation are stripped away" [79]. The Internet expands and at the same time ruptures the fine texture of people's everyday experience. The *darkness* of cyberspace seems to be due mainly to the physical absence of the other participants to the interaction. Yet, separation of experience from physical presence is not new for human beings. If we think of the situation in which language was first used to refer to someone (or something) not physically present, we see that a good measure of *darkness* entered human discourse at that point, but human experience was able to make sense of the newly opened space and to expand its domain through language. Think of when human beings started using written language to talk of absent people, or of strange entities such as gods and demons, totemic animals and dead heroes.

The *darkness* produced by artifacts grew thicker and thicker with every stage of human cultural development, yet human control over the environment increased with the invention and use of artifacts mediating between human actors and their physical, social, and ideal worlds. Human beings invented artifacts such as language and writing, but they learned to control them so to enhance their experience, not to be lost in the darkness they had created.

Human beings persist in creating fictitious, artificial, "unreal" worlds which bewilder them until they find ways of assimilating them within their ordinary lives. It is often said that our understanding of situations depends on the mass of information available; the current situation of the Internet use gives evidence of the contrary. We know a lot about the Internet and its current use, yet we are still confused about its nature as a social artifact. Especially, we may be misled by metaphors like that of the "impact" of technology on

society. While the Internet has achieved very good standards in the physical presentation of “reality”, much work still remains to be done to develop an equally robust conceptual framework capable of supporting its ongoing social construction as a mediating environment for human experience.

Artifacts are *embodied social projects* and as such they have politics [80]. The Internet is no exception to this norm; in fact, it is the space in which two different visions of communication and society are clashing. The original project of the Internet as a totally accessible communication space was produced by a small community of scientists and technologists which was formed since the early 1960s by the Advanced Research Projects Agency (ARPA) of the US Department of Defense. This community of scientists, which prospered for almost three decades in splendid isolation protected by the “great divide” provided by ARPA and separating it from the broader social world, nurtured “deeply engrained institutional values of intellectual curiosity, informal meritocratic reward structures, and egalitarian presumptions enabled a highly disaggregated and distributed population to work together to create an artifact quite unlike any seen before” [81]. This state of affairs changed abruptly in the early 1990s when the creation of cyberspace was accomplished and the Web made available to the outside world: commercial firms, non-profit organizations, and the media. With the achievement of its task, this unique scientific, social, and moral community began to dissolve and the net was invaded by a host of newcomers. The ethos of the original community which created the Internet is still present in the Web but it is at present challenged by many of the new inhabitants of Netville.

A different ethos is currently pervading the Internet: that of profit for “private investment”, ranked first among the five “values” which should direct the development of the Global Internet Infrastructure (GII) by the U.S. Vice-President Gore (Office of the Vice-President, [82]). Many analysts think that the Internet is prone to become prey of “unrestrained corporate ambition and private design” [83], following in that the fate of the other American media: “The American media system is spinning out of control in a hyper-commercialized frenzy. Fewer than ten transnational media conglomerates dominate much of our media; fewer than two dozen account for the overwhelming majority of our newspapers, magazines, films, television, radio, and books” [84]. Although more optimistic experts believe that the Internet can escape the dire fate of the previous media thanks to its decentralized structure [85], there are good reasons to consider the survival of the Internet as a “public good” - open to communications of all kinds coming from associations of all kinds - seriously endangered.

There is strong evidence of the fact that search engines “systematically exclude (in some cases by design and in some, accidentally) certain sites and certain types of sites in favor of others, systematically giving prominence to some at the expenses of others” [86] p. 169. Information seekers, whose navigation depends heavily on search engines, are guided to sites whose owners are able to pay to be indexed quickly and ranked high [87]. Software agents - also called softbots, spiders, crawlers, or robots - which explore the Web to retrieve documents to be indexed tend to favor the rich and powerful over the less fortunate site owners: “of the 100 top sites - based on traffic - just 6 are not .com commercial sites. If we exclude universities, NASA, and the U.S. government, this number drops to two” [88]. If we think that, according to Lawrence & Giles [89], none of the search engines considered in their study is able to index (individually) more than 16% of the total information indexable we realize how little coverage is granted by current search engines and of how scarce visibility is given to social actors who are not rich and powerful and can hardly be found in the immense space of the Web. If this bias will not be corrected soon it will jeopardize the values which have gained vast social support to the development of the Internet. Artifacts have politics, and politics may mean social conflict for access to the net. Equal access is not always granted, although it is somehow written in the DNA of the Web.

3.6 Conclusions

The current use of the Web is not homogeneous, but much diversified: from e-commerce to gambling and pornography, from psychotherapy in the cyberspace to electronic mail in corporations. The Internet is also pervading various different environments, moving toward a less U.S.-centric international Internet [90] in which situations of Western Europe, India [91], China [92] and the developing countries [93], present different landscapes. The ubiquitous presence of the Internet does not suppress but rather enhances the particularities of the different professional, linguistic, organizational, cultural communities that use it; the ways in which global and local interweave in the Internet finds a fitting explanation in Bakhtin's [94] conception of culture as a realm made only of boundaries, a space in which differences can be acknowledged.

The spread of the Internet is changing the way people use information and communicates among themselves. Cultural psychology provides researchers on new media with suitable conceptual tools to understand the relationship between technological innovation and social change. They focus our attention on mediation processes, on the subtle shifts in human agency which accompany the diffusion of new technological tools, on the emergence of new landscapes for human cognition and communication.

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