Giuseppina Pellegrino

Department of Sociology and Political Science

University of Calabria

Via Pietro Bucci 87036 Arcavacata di Rende (CS) – Italy

IAS-STS Visiting Scholar (October-November 2008)

gpellegrinous@yahoo.com

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Ubiquity/Mobility:

Two case studies between future interaction and current practice

Abstract

Ubiquity can be defined as a continuous aspiration to omnipresence, a desire which has a strong technological embodiment into discourses and artefacts supposed to be mobile and accessible anywhere anytime (at least in principle). This contribution focuses on the sociotechnical processes which make artefacts more and more convergent, multi-functional, miniaturized and at the same time distributed in the environment. Ubiquity and mobility are two sides of the same coin, based on the pervasiveness of technological mediation and the extended, plural mobility of contemporary society. The dimension of ubiquitous communication is addressed drawing on an ongoing research. Preliminary findings of interviews with researchers in the field of ubiquitous computing and consultants in international organizations will be compared, in order to show how ubiquitous communication is the result of practices and discourses performed by specific social groups.

Introduction

Nowadays we are said to live in a mobile society whose icon is the mobile phone. Such a portable device has changed the way we interact and behave in our daily contexts, in both public and private settings. However, this paper aims to address issues beyond the evidence of a massive diffusion of the mobile phone in both Western and developing countries.

Mobility is one of the key categories in contemporary sociology , whose status has been changing so to indicate not anymore the problem of class, gender, career and vertical movement as signalling

a change in some social positioning. Rather, mobilities as plural depict the interweaving overlap of different, multiple ways of being on the move: physical and virtual; movement of objects, goods, risks, cultures and information, of people and their values (Urry 2007).

As such, mobilities encompass a new field of theoretical and empirical inquiry, where all the kinds of movement and displacement of people, information and objects can be comprised, from travel and tourism to migration and diaspora, from mobile work to mobile communication.

Mobility, either coerced or uncoerced, is a relational concept which cannot be understood without its opposite, that means immobility (Adey 2006). Some kind of anchorage and root, even temporary, is required to make sense of the most nomadic lifestyle. The same mobile phone has a fixed reference, the number through which the receiver can be reached .

Furthermore, accessing mobility is a resource which can be at unequal disposal of individuals and groups, so emphasizing differences, inequalities and uneven distribution of the sociotechnical infrastructures, devices and literacy necessary to the choice of a mobile life.

The sociotechnical constitution of mobilities

Being mobile depends on sociotechnical processes which make artefacts more and more convergent, multi-functional and pocketable (e.g. the smart phone). These processes rely increasingly on ICTs, but also on various infrastructures of transport. It is the convergence between the two assemblies which make possible communicating on the move.

Far from being something external, impacting unilaterally on our daily lives, technology is the result of conflict and negotiation among key social groups, which construct it (Bijker 1995). In particular, technology is deeply involved in the way people, objects and information are more and more 'on the move'.

Technological mediation of mobility is both based on specific artefacts, e.g. mobile phones, laptops, PDAs; and on complex infrastructures of sociotechnical networks, e.g. electricity, the Internet, broadband networks, wireless networks. Such infrastructures are the invisible and embedded texture which make possible for people, objects and information being mobile. They represent the pre-requisite of interconnections which allow communication while being on the move, as well as the portability and transferability of data and information across large networks.

Technologies of/for mobility can be situated at the crossroad of complementary phenomena which characterize contemporary forms of technological mediation: convergence, or the trend towards uniformity of technological platforms and systems; saturation as the web of interoperability on which infrastructures are built up and linked to each other; hybridity as the constant interlinkage of human and non human components; ubiquity as aspiration towards omnipresence.

Convergent technologies

Different types of convergence can be identified in technologies for mobility. Generally speaking, technologies tend to converge as for markets, functions and infrastructural architectures (cf. Pellegrino, 2008). Furthermore, there is a material profile of this convergence, which has to do with miniaturization and portability of multiple, multifunctional mobile technological artefacts. I-pods, smart phones, PDAs, all of them concentrate in themselves a high diversity of tasks, functions and channels of communication. Multimedia is part of the emergence of convergence as a long lasting trend in media and information history. Convergence is particularly linked with the body and redefines materiality and visibility of technology. Size and multi–functionality of portable technological devices make them more and more embeddable, wearable and textured within or around the body.

Saturation of mediated environments

Technologies saturate and fill up not only individuals' body but also surrounding environments.

Such a saturation makes both the body and the environment hybrid, and the distinction between what is 'natural' and what is 'artificial' more and more conventional

The texture of saturation is, like infrastructures, integrated and based on the concept of interoperability (Bowker and Star 2000). As such, it is invisible, transparent, therefore difficult to grasp in its patterns. It happens with all complex infrastructures that we become aware of their existence when they stop working out, when any kind of breakdown, interruption and misuse occur. This phenomenon can be referred to the mobile phone as ubiquitous technology accessible everywhere/everytime, whose saturation increases expectations of continuous availability of participants to the communicational process. More generally, the concept of saturation describes well the way our bodies and environments are intertwined into inextricable chains of socio-technical relationships, like in the 'everyware' texture of ubiquitous computing, imagined as a technology able to colonize surfaces and settings of everyday life (Greenfield 2006).

Hybrid bodies, artificial natures

Interoperability and saturation make technological devices, networks and media closer to each other. In this respect, as they become closer, differences and boundaries between them and between technology and people go in the background. Hybridity, mixture, mingling of the human and the non-human, as well as the continuous texture between a mediated body and an environment saturated with technologies, play a major role on the scene. Indeed, proliferation of hybrids and the

erection of the boundary between nature and culture are part of the modernization process (Latour 1993). Everyday we delegate our actions and perform activities through some sociotechnical device, so that it becomes integral part of our sociality and inextricably assembled with our agency. Distinctions between humans and non humans, people and objects, result from depuration and purification which foster the emergence of hybrids. What appears to be 'natural' is highly artificial, and artificially naturalized through rhetorical strategies. All of us are hybrid and hybridised: the body is more and more empowered through technology; communication cannot be conceived of without mixtures of media and assemblies of sociotechnical devices. A mediated dimension is more and more prominent even in face-to-face and body-to-body communication, through conversations referred to both the mass and personal media contents, styles and features.

Ubiquity as extension of co-presence

Ubiquity can be defined as the tension towards 'being anywhere anytime' as opposed to the *hic et nunc* constraints of face-to-face interaction. The mobile phone, again, is an example of such a ubiquity because of the constant availability it makes possible. The tension toward reaching a virtual, potential omnipresence is supported by convergent artefacts, which make ubiquity more at hand than ever. Being here and there, performing multiple tasks at the same time, distributing the attention to different media, communication partners and communicational routines, is an everyday experience for an increasing number of people.

Therefore, all sorts of co-presence deserve attention and dignity as research objects. It is not just the face-to-face interaction that founds communication on the move, rather extension of proximity and mobile co-presence are among the most prominent transformations we face with.

Ubiquity as aspiration to omnipresence is embedded into discourses, information and artefacts supposed to be accessible anywhere anytime (at least in principle). The myth of ubiquitous computing as invisible, unobtrusive infrastructure embedded into material surfaces founds a prolific literature. Moreover, it is exemplary of a trend to imagine and design contexts of interaction, both public and private, where materiality of technology is redefined.

An ongoing research: Disconnectedness and ubiquity.

The dimension of ubiquitous communication and extended co-presence is the topic of an ongoing research partly carried out during my visit at IFZ in October-November 2008.

On the one hand, ubiquity is framed by looking at design of advanced computing systems, defined as 'ubiquitous', sometimes 'pervasive' and, of course, mobile. Designers represent a peculiar social

group involved in technology construction: they are translators of users' needs as well as of a vast imagery concerning potential developments of current and future technologies. Studying design allows to highlight gaps and continuities between the public discourses of future technology and their translations in artefacts and contexts of interaction.

The interview stage started at Klagenfurt University in November 2008. The key informants were researchers studying solutions in the field of ubiquitous computing and networked/embedded systems.

On the other hand, ubiquity is experienced by users of current sociotechnical systems, especially by those users who are highly mobile in space, time and their work. In particular, the second case study is represented by consultants in international organizations. They are peculiarly mobile as: their communicative and work practices are situated culturally and their status of 'boundary operators' obliges them to comply with both standardized methods of consultancy and high specificity of on-site projects. Furthermore, their mobility is to some extent an 'extreme' experience of diversity: not least, diversity of infrastructures available in specific settings. Such a diversity allows to focus on the relationship between mobility and access to technologies, emphasizing breakdown in the continuous texture of ICTs, often described as 'ubiquitous'. Through individual in depth interviews, the experience of ubiquitous computing designers and mobile consultants is focused, with reference to relationships between proximity and distance, ubiquity of information and breakdown in technologies expected to guarantee continuous connectivity. The interview stage started in October 2007 in Rome: The key informants were consultants involved as free-lancers or independent experts in monitoring, evaluating and carrìying out projects in developing countries

The following paragraphs summarize the findings emergent from pilot interviews with both the designers and the consultants.

Future interaction: ubiquitous computing design and the dimensions of envisioned mobility
Studying design of technologies means to understand the vision innovators inscribe into artefacts (Akrich 1992) as well as the set of discourses, practices and imagination involved in bridging gaps between the state of the art and the virtuality of future behaviour.

When looking at the design of ubiquitous computing, this hybrid set of meanings associated with the design work is even broader, since

"Ubiquitous computing is not a technology but a paradigm (…) It means you get rid of the dependence between digital artifacts and physical tools" (R.).

Three dimensions emerged from the pilot interviews. First, the necessity to configure transitions between physical and virtual worlds, where access to digital resources is independent from single devices or single communication tools. Secondly, the awareness about the fact that big gaps between attractive solutions proposed in the media and current technological possibilities constrain the designers' work. Last but not least, the policy implications of ubiquitous computing research, due to the fact that shaping advanced infrastructures where devices can be fully interconnected and able to 'talk to each other depends on availability of scarce resources. As another informant put it, *"We are allowed to use a very small bit of the spectrum for wireless communication experiments. And our aim is to make the best of it" (W.).*

Solutions and ongoing projects focused on at Klagenfurt University showed how ubiquitous computing is concerned with envisioning the future of mobile information, data and environments. Issues of social desirability with reference to privacy and control also emerged from the interviews.

Dimensions of extreme mobility: current interaction by mobile consultants in international organizations

Co-presence as based on face-to-face interaction is a feature in 'traditional' mobile work (e.g. sales representatives): However, across history of the industry and the media the possibility of working far away from a central place has changed, especially through the mobility of information enabled by ICTs.

Work itself has become a central practice in people's everyday life and the ongoing research carried out aims to focus on the relationship between mobility as a 'permanent' characteristic of the practice (for some communities/professions) and its increasing technological mediation.

Such a mediation is inquired departing from a phenomenological standpoint, according to which what is obvious is not questioned until it does not break down for any reason.

The key informants interviewed, due to their experience of fieldwork consultants in developing countries, were exposed to diversity of infrastructural density. However, such a diversity is less broad then expected, as well as highly situated:

"Many countries have just cell phones, landlines have been destroyed because of the wars like in Congo. In many cases the basic infrastructures are missing, but there are the most advanced ones" (M2).

*T*he same consultancy mission and the mobility style associated with it, can be very different, as pointed out by one of the informants:

It's a very diverse world, you can meet any kind of people. You can do this job very badly, just looking at signatures and not being empathic. There are at least two kind of monsters: the young

son of the UN diplomat able to speak perfectly 5 languages but not really understanding this job; and the cynical cooperant interested in getting rich by cutting and paste the reports" (R.).

The prevalence of integrative communicational patterns across different tools is confirmed by most of the interviewees, but one of the crucial points is the range of feelings associated with the experience of disconnectedness, of not being able to access and communicate continuously:

"Until it lasts one week, I am almost happy not to be able to reply immediately to email. Chat communication is more demanding, people are there waiting for your reply (...) Some people are really addicted to communication, I am not like that" (G.).

Disconnectedness is the opposite, complementary side of ubiquity as desire of omnipresence, continuity and uniformity of communication.

Conclusion and further research

Through two case studies concerning the current and future state of mobile interaction, the ongoing research summarized in this paper aims to inquire potential opportunities and risks emerging from pervasive, ubiquitous technologies seen as the latest frontier in configuring a transparent and seamless connectivity between bodies, environments and information.

In fact, the way we live, act and communicate while being on the move is a prominent part of contemporary forms of social interaction and identity. Technological mediation of mobility configures a convergent, saturated and hybrid modality of being co-present in private and public settings as well as in daily life.

Despite the big emphasis on the global and ubiquitous' character of 'going/being mobile, contextual issues constrain relations between infrastructures, ubiquity and communicational patterns In this respect, the crucial point for further research is represented by the crossroad of current practice of communication and design work envisioning a pervasive, ubiqutous interaction.

The constraints to current mobilities can provide key indications to orient design of advanced information infrastructures, by pointing out the relational and situated character of movements of people, objects and information, as well as the limits and resistance current practice poses to future, mixed worlds of sociotechnical interaction.

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