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The Noosphere of Objects

Some Thoughts on the Recent Wave of Mobile Communication

New Tagged Reality

The new phase of mobile communication urges us to redo an act of creation: After He himself gave names to the firmament God asked Adam (according to the Bible[1]) to call all living members of his Creation by name. Before, He had already given names to Day and Night, to Heaven, Earth and the Sea. In our Age, the need for mobile communication and the Internet of Things urges us to add electronic devices to the collection of things and living beings as part of our reality. By naming them each object is characterized in a unique way and can be identified within the universe of things. In contrast to the allocation of names by God himself or Adam direct personal naming is no longer possible. Today technology assists us to give an answer to the question "Who?" Naming is only a first basic and essential step, not only important for human beings to be able to orient themselves, but also for business. Without names markets cannot work, costs cannot be accounted, stocks cannot be assessed, and profits cannot be earned.

Technology for Identifying Objects

This new kind of naming has already its technical history. With the introduction of the **Barcode** objects in the supermarket have become individuals. Their identity can be established at the Electronic Points of Sale at the checkout. Although at many places a human cashier still is used to identify the individual objects via an optical scan and to produce vouchers for the customer, in the future self service could become possible needing less people in the shops. **RFID (Radio Frequency Identification)** offered the next step of technology. RFID can give the answer to the question "Where?" It uses lower frequencies of the electromagnetic spectrum than that of light. RFID chips are applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader.[2] They play a growing role in transportation and logistics. Still their range is limited. But with the upgrading to GPS **(Global Position System)** logistic systems can operate worldwide, "providing navigation for aviation, ground, and maritime operations. Disaster relief and emergency services depend upon GPS for location and timing capabilities in their life-saving missions. Everyday activities such as banking, mobile phone operations, and even the control of power grids, are facilitated by the accurate timing provided by GPS. Farmers, surveyors, geologists and countless others perform their work more efficiently, safely, economically, and accurately using the free and open GPS signals".[3] GPS is the most recent way to add more information about objects to their names: their positions in time and space. GPS answers all three questions in combination: "Who", "Where" and "When". This information and other data related to the state of the object can be exchanged within

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[1] "And God called the light Day, and the darkness he called Night." (Genesis, Chapter I, 5, in: Thomas Scott, The Holy Bible, Vol. I., Glasgow 1842);

"And God called the firmament Heaven (ibidem, 8)…, And God called the dry land Earth; and the gathering together of the waters called he Seas : and God saw that it was good" (ibidem, 10)

"And out of the ground the Lord God formed every beast of the field, and every fowl of the air, and brought them unto Adam, to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof." (ibidem, Chapter II, 19, p.21)

[2] http://en.wikipedia.org/wiki/Radio_Frequency_Identification

[3] http://en.wikipedia.org/wiki/Global_Positioning_System

the network. The electronic sphere is kept informed about the world and can start to act and interact with human beings in a meaningful way.

Seamless Information Exchange

Since more than one century technically mediated human communication is provided by the largest machine of the world, the telephone. It experienced various stages of development. In the beginning it was more or less reserved for business. Many people used one single device in the job floor. In the year 1879 294 of the total of 300 telephones in the United States were placed in business locations[4] and were used by the staff. Over time the telephone became a device for the households of the masses with only a few users per phone. Mobile communication via the cell phone gave room for complete individualization. In many cases people own more than one phone. In developing countries it was possible to skip the era of the fixed line. Today three out of four mobile phone contracts are concluded there. In India we see growth rates of 52% per year.[5] The cell phone has become the name tag of human beings.

More recently, the Internet has become another very important global infrastructure for the diffusion and exchange of information. Up to now it is mainly used for visual information (texts, pictures, photos, videos), but more and more it expands into direct language, sound and video communication. All three developments, GPS, mobile communication and the Internet, exploit the same digital technology and the same resource, the bit. For this reason, in the future we will see growing interactions between traditional networks of human communication and the network of things.

Three Categories of Communication

From the point of view of data exchange the expanding infrastructures offer three types of communication:

- between people,
- between people and "non-people",
- and between "non-people".

Similar how medieval philosphers have structured the cosmos the term "non-people" covers animated beings as well as dead things. Of course it is not assumed that "communication" between humans is the same like between things.

The first category (between people) does not only cover traditional direct bilateral communication between two human beings, but also 1 to n communication, video or audio-conferences and the use of mobile information services to coordinate individual movements. The second category consists of telemetric and tele-chiric tasks (including the tele-control of animals and vessels), while the third focuses on communication and coordination of cultural artifacts.

Where the tasks of "things" include local coordination, the precise determination of the spatial location of the elements of mobile communication is of importance (e.g. for the adaptation to new time-, climate or elevation zones). GPS or similar systems have already solved such tasks partly.

Meta-data

This new kind of tagged reality does not only offer new potential for the direct coordination of events within the realm of technical artifacts or living beings, it produces also pro-actively strata of meta-data which might be used for research purposes or for less honest ones. I will come back to it later.

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[4] Flichy, P. (1994): Tele - Die Geschichte der modernen Kommunikation. Campus. Frankfurt/Main.
[5] Seifert, T., A. Bengelstorff, S. Zastiral (2009): Wie das Handy die Welt verändert. In: Die Presse, 7. 11. 2009, p. 38.

Socio-economic Framework in the European Union

The diffusion and use of technology is not only a question of technology itself. It depends on the socio-political structures, on prices and incomes, on the appropriate skills of people, their culture, and – of course – on the need and willingness to use it. One can say that the life style of the middle classes in Europe is coined by favorable conditions for borderless mobility of goods and persons with respect to technology (more efficient propulsion and transportation technologies) and politics (EU-enlargement, Euroland). At the same time people face more and more fragile side conditions with respect to the economic (financial crises and crises of the real economy), energetic (peak-oil) and ecological dimension (global warming, greenhouse gases, chemical pollution). Recent decades experienced an increase of long-distance mobility for goods (international shipping, long-distance truck and air transport) and for people. To a certain degree the middle classes became modern nomads (mass tourism, business travels, and exchange of researchers in the European knowledge space, travels of the international Bureaucracy, sport and cultural events). On the other hand, migration into the wealthy countries of the European Union has tremendously increased. Cheap modern digital communication technology accompanies and supports effectively these processes of long-distance mobility.

Short-distance mobility is a different case. Not only accompanies mobile communication the traditional physical movements of people, but at the same time it allows for and creates new patterns of behavior in the business world (flexible administration in the mobile office) and in leisure time (ad-hoc meetings, fuzzy planning).

Fields of Opportunities

By various scholars mobile telephony and the Internet are seen as the world wide infrastructure for the development of the Noosphere. The term was coined 1922 by Pierre Teilhard de Chardin (1881 – 1955) inspired by Édouard Le Roy[6]. Later on, Ukrainian scientist Vladimir Ivanovich Vernadsky (1863 – 1945) saw in it the third stage in a succession of phases of development of the earth, after the geosphere[7] (inanimate matter) and the biosphere[8] (biological life). Just as the emergence of life fundamentally transformed the geosphere, the emergence of human cognition will fundamentally transform the biosphere. In this theory, the principles of both life and cognition are the essential features of the earth's evolution.

It is not the first time that new technologies inspired the fantasy of the people and linked them to their interests and desires. The optical telegraph (Claude Chappe, around 1782) inspired the French Revolution to control and coordinate troop movements faster than their enemies; in the beginning of the 20th century in the United States Henry Ford expected and created an economic upswing by mass production of cars and an improved system of remuneration of workers; electrical generators inspired the slogan "*Communism, this is Soviet power and electrification of the whole country*" in the Russian Revolution.

Therefore it is no great surprise that contemporary digital infrastructures inspire the fantasy of people today: In 1998 the Global Consciousness Project[9] (GCP) began to investigate potential interactions of global consciousness with physical systems. They tried to uncover patterns in self generated random numbers that might correlate with major world events.

Although it looks like complete nonsense, any such imagination bears some kernel of truth: People have the opportunity to communicate with each other and with the objects of their environment

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[6]   Édouard Le Roy (1928): Les origines humaines et l'evolution de l'intelligence. Paris.
[7]   http://en.wikipedia.org/wiki/Vladimir_Vernadsky
[8]   invented by Austrian geologist Eduard Suess, whom Verdnadsky had met in 1911.
[9]   http://noosphere.princeton.edu/

cheaply and on a global scale. The inclusion of objects into the already existing electronic infrastructure gives room for new developments. While people in the past had directly intervened, located, moved and placed the artifacts in their environment, in the future people just place orders to the system and define their wishes. The software will do the rest – once again worldwide.

Global information networks offer the possibility – not the necessity - to approach political unity of the world and to perform actions in peace and freedom, in a cooperative and empowering way.[10] But technologies always can be used ambivalently: for welfare or for warfare.

New Vulnerabilities

It is clear that any extended infrastructure shows the two faces of the God Janus. On the one hand infrastructures create new opportunities and new coping mechanisms; on the other hand they produce dependencies on their very existence.[11] If the everyday life as a rule is based on any infrastructure, in case of a technical failure the routine will be interrupted. The larger in scale and scope the electronic infrastructure will be the more possibilities for systemic malfunction could come into existence. But the danger is not limited to technical failures. It could also arise from purposeful human action and intervention into the system. Viruses could spread faster and in a larger area than before. If the Internet of Things is extended to cars, a failure in the control of its movement could produce a disaster. If the availability of artifacts is organized via the Internet of Things, any breakdown will restrict business as usual; in some cases it could lead to a general breakdown of social or individual life. It would be advisable to develop together with any new infrastructure a 'Plan B'. On its basis procedures essential for survival could be organized in an emergency case.

Without doubt there will emerge the need for the development of new branches of the Law. The question who is responsible for disasters and any malfunction of the Internet of Things and who has to pay for them will become crucial in the future. Insurance companies have to deal with it.

The increasing amount of meta-data is not free from ambivalent uses: Research could find ways of how to feed meta-data on e.g. the location of people into a traffic control system to prevent a traffic jams, it could also be used by the police to attack more effectively demonstrators who exert their basic right on freedom of meeting and association.

Conclusion

As a general tendency one can observe a next step in the creation of a kind of second nature by humankind. It is no longer dumb and deaf. Electronic communication allows for sensitivity, action and interaction with human beings. In front of such great technological possibilities, but at the same moment facing ecological and economic restrictions and the rebound effect, the question has to be asked: What do we really need? There is a definite seduction (promoted by the economic interests of transnational enterprises) to spread the message of self-organizing swarms of technical artifacts assisting human beings everywhere on the planet, of the talking fridge which refills itself or of the stove which cooks dishes with distant ingredients etc. The intrinsic ambivalence of new mobile communication technologies demands also to establish a public discussion process (where the options are realistically presented) and new institutions with democratic decision mechanisms on their implementation. It is of central importance to define access and control rules in a way that the emerging infrastructure is not restricted to a powerful and wealthy elite, but is opened up to everybody by a clever management. New technologies should only be promoted if they allow for a more sustainable life for human beings in both, the environmental and social aspects of sustainability.

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[10]   Hofkirchner, W (2002): PROJEKT EINE WELT: Kognition – Kommunikation – Kooperation. LIT Verlag. Münster – Hamburg - London
[11]   Castells, M, M Fernandez-Ardevol, J Linchuan Qui, A. Sey (2007): mobile communication and society – a global perspective. MIT Press. Cambridge.