

Information and Communication in a Networked Infosphere - a Review of Concepts and Application in Social Branding

Información y Comunicación en la Infosfera en Red - una Revisión de Conceptos y Aplicación al Desarrollo Social de Marca

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Abstract

This paper aims at providing a contribution to the comprehensive review of the impact of information and communication, and their supporting technologies, in the current transformation of human life in the infosphere. The paper also offers an example of the power of new social approaches to the use of information and communication technologies to foster new working models in organizations by presenting the main outcomes of a research project on social branding. A discussion about some trends of the future impact of new information and communication technologies in the infosphere is also included.

Key Words

Information - Communication - Infosphere - Technologies - Social branding Interaction

Resumen

Este artículo tiene como objetivo proporcionar una contribución a la revisión global del impacto de la información y la comunicación, y sus tecnologías de apoyo, en la actual transformación de la vida humana en la infósfera. El artículo también ofrece un ejemplo del poder de los nuevos enfoques sociales sobre el uso de las tecnologías de información y comunicación para fomentar nuevos modelos de trabajo en las organizaciones mediante la presentación de los principales resultados de un proyecto de investigación sobre desarrollo social de marca. Una discusión sobre algunas de las tendencias del futuro impacto de las nuevas tecnologías de la información y la comunicación en la infósfera también se incluye.

Palabras clave

Información - Comunicación - Infósfera - Tecnologías - Desarrollo social de marca - Interacción

1. Information and communication in the infosphere

Life, as we as human beings understand it, is a complex and permanent relationship among all the elements that compose the ecosystem we inhabit. This ecosystem is constituted by natural elements and artificial elements. Natural elements are all the living beings that form the animal and vegetal worlds and also the myriad of elements that compose the geological and atmospheric environment where life exists. Artificial elements are all the elements humans have developed using the existing scientific and technical knowledge available in the many generations that have ever since populated our planet.

That complex and permanent relation among the elements that compose our ecosystem is omnipresent independently of the level of analysis one adopts. Life in the natural world exists due to the complex chemical and physical interactions between basic life structures, such as cells. Life in the artificial world is possible because we developed its components in some way compatible with, or adapted to, the human nature, often even as an extension of the human body, such as spectacles or a car.

When the elements that compose our natural and artificial world interact in that complex and permanent relation, they do it by exchanging sets of *datum*, or data. Cells interact by exchanging electrical and chemical data. Human beings interact by exchanging signs, using data as building blocks of codes that compose the oral, written or body languages we use in everyday life. Computers interact with other computers by exchanging digital data in a format previously agreed.

The way each element of our natural and artificial world act, or react, to a specific data originated from other element depends on the nature of the elements and the specific context of the interaction process. When a human hears data (receives sound) originated from the clapping of hands from another human, this may be understood as an applause if the context is a concert or a conference, but should be understood differently if the sound originates from a music student that is trying to familiarize with the timing of the notes that compose a musical piece. Data having a specific meaning in a specific context are also referred as information and are the basis of communication both in the natural and in the artificial worlds.

Floridi (2010), in his *Philosophy of Information*, a philosophy grounded theoretical framework still under development, provides an elegant, because aiming at being general, proposal of mapping of the information concept (figure 1). According to this author (*ibid*) Information, understood as semantic content, requires the existence of some well-formed and meaningful data and it can be factual, despite being true or untrue, or instructional. Environmental information, which exists both in the natural and the artificial worlds, is meaningful data deployed by some non-intelligent producer. Environmental information is instructional by nature, this meaning that it is objective, by opposition to information understood as semantic content which (subjective) meaning depends on the context.

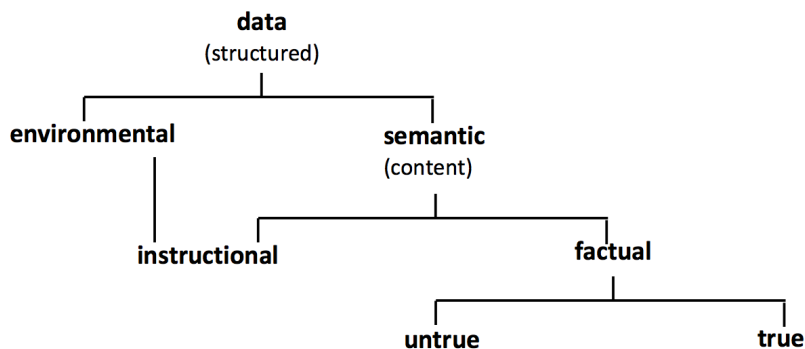


Figure 1: A map of information concepts (adapted from (Floridi, 2010, p. 20)).

The concept of information has been addressed by many different authors, but a special reference needs to be made to the celebrated contribution of Shannon (1949) in his *Mathematical Theory of Communication* (MTC), often designated by *Theory of Information*. In this seminal work, Shannon provided the foundation for the digital representation of data on a binary basis that is a main building block of our current artificial, and digital, world. In the MTC the information concept is related to the probability of a system being in a specific state, in some way also expressing its entropy, leading to the conclusion that a binary system is the ideal support to represent information on a mathematical basis because it enables representing information based on the smallest possible amount of information a system may assume (0/1, binary digit or bit).

Other authors have also addressed the concept of information influenced by specific contexts and/or specific professional activities such as Journalism, Archivology or Biblioteconomy (Gleick, 2011; Deuze, 2003; Lewis, 2012; Rodrigues, 2011; Silva, 2006).

These different views of the information concept, however, are not opposite or even alternative. They correspond to different viewpoints and/or levels of analysis and may easily be identified as coexistent in many examples of our daily life. When one wants to read online an old newspaper issue stored in a digital archive, data flows in binary format through the Internet to convey the relevant metadata required to search the archive and, after the retrieval is successfully accomplished, the content is transferred from the archive, again in binary format, representing semantic content to the reader. In this example a computer expert understands information as binary data being exchanged between computers across an Internet connection according to a specific and standardized protocol; an archivist recognizes the newspaper issue – the document, and its corresponding archive metadata, as the relevant information exchanged; and a journalist will identify information as the (true or untrue) content of the different texts that compose that specific issue of the newspaper.

The same diversity of meaning can also be found in the concept of communication, depending on the epistemological ground that one stands from. For a computer engineer, communication is basically the exchange of data between systems by using an electrical or optical link, adopting some specific protocol, i.e., a set of rules that the systems involved in the data transfer agree to use to generate and interpret the data flow. This is the case of the Internet, which uses the TCP/IP (Transmission Control Protocol/Internet Protocol) family of protocols, created and managed by the Internet Engineering Task Force (IETF) and adopted by the industry worldwide. For a social scientist, however, communication is a concept closely related to the shared building of meaning based on the information (semantic content) exchanged in human interaction (Rosengren, 2000).

The constant deployment of new and more powerful technologies, that amplify our artificial world, dramatically increase the quantity and diversity of data existing in our ecosystem. The current international research efforts related to the so

called Internet of Things, aiming at fostering the Internet based communication capability of virtually “everything”, has been providing several good examples of the explosion of information sources the Humanity is continuously adding to our artificial world¹.

The awareness of the paramount relevance of information for humans led to the emergence of the expression *infosphere*, a neologism that highlights the idea that we live surrounded by information or, more precisely, by data. In Floridi (2014) a comprehensive discussion of how the infosphere is reshaping the human reality, in different aspects of human life, is presented.

Considering the interactions in the infosphere, humans act as producers and receptors of data generated by other humans and also by other agents in the natural and artificial worlds. When acting as receptors, humans depend on the five human senses (vision, hearing, taste, smell and touch) to receive data. The mental, rational and emotional, interpretation human beings have of their ecosystem is based on the data received through the human organs through structures sensitive to specific external stimuli. When acting as producers, humans use other human organs, such as the vocal chords and the muscular and skeletal system, to generate data using socially agreed codes and protocols (such as oral language, written language, body language and song).

The development of the artificial world has led to the deployment of technologies able to deal with some types of information existing in our natural world and this is often referred as multimedia technologies. Such are the cases of sounds and images (still and moving), which are correlated, respectively, with the hearing and vision senses. However, we still have not yet achieved to develop affordable and scalable technological solutions to deal with information related with the other three senses (taste, smell and touch). Robotics and artificial intelligence are, by the other hand, showing the power of technologies to amplify the human interaction capabilities, namely as producer of data, both in the natural and in the artificial worlds, as many applications show in very diverse fields such as health care and education or even unveiling the future possibility of the existence of new types of artificial matter (Goldstein, 2009).

2. A networked infosphere

Human beings also tend to organize themselves in networks for diverse reasons. The internet based networked infosphere is one of the most relevant networks today for communication mediation and information management and highly dependent of world wide web (www) technology introduced for general use at CERN² by Tim Berners-Lee in (1989), but mostly dependent of how users are shaping it since 1991 in public domain. The human-centric approach present since the www foundation, and in conformance with several research areas, namely human-computer interaction, traditionally contextualized in computer science, was a major shift in developing technological interfaces. This approach is predicted by Lipovetsky (1998, p. 42-43) when he discusses the individualism in the postmodern age and the seduction strategies that are adopted to deliver what each and every human being desires. Lipovetsky actually mentions that the personalization process is to enable flexible devices and promote communication. This process evolved and nowadays user profiling with cookies technology is an example of an automated personalization process that manages interaction behavior information mainly for marketing and/or commercial purposes. The fundamental cause for this human-centric development related with computational devices can be found in research centres and some industry that invested in innovative user-centered design (Norman, 1988) methods and techniques in their project management models till today. Donald Norman pioneered the user-centered design (UCD) concept in (1988) centralized in user needs associated to a product and from then three major design methods have emerged: cooperative, participatory and contextual design. These UCD methods continue to answer a classical problem in technology design, the minimization of the distance between designer and user mental models of artifacts, services or systems, a problem that was already well documented in the founders of Internet in the 60s (Licklider, 1968). UCD now represents a process where designers are committed to predict user needs and evaluate usage behaviors with a specific product. Software development industry adopted "user-centered design" and "user experience" (UX) principles (Norman, 1988), with SCRUM (Beedle, 1999), an agile software development method, representing one of the most popular UCD methods. Academia and Industry have also fostered norms based on UCD development strategies; such examples can be found in the European ISO

9241 standards (ISO, 1998) and (ISO, 2010). ISO (2010) is a recent European norm, the ISO 9241 - Part 210, that integrates all the main UCD approaches mentioned previously. ISO 9241 - part 11 provides guidance on usability and suggests a methodological approach to measure effective, efficient and satisfaction while users use specific devices in specific contexts.

Alongside these disruptive and innovative interface design methods that shifted the research and development agenda of computational devices into the core concerns of human perception, new input/output devices have occurred and consequently new interaction paradigms and metaphors got to the market and into extremely popular use. Mobile computational devices such as smartphones and tablets are high ranked examples of technologically mediated communication and information devices for personal use. This is an extremely recent phenomenon: interaction paradigms had stalled in the end of the last century as mentioned by Mathew Turk *"There is no Moore's Law³ for user interfaces. Human-computer interaction has not changed fundamentally for nearly two decades. Most users interact with computers by typing, pointing and clicking"* (2000, p. 1), and the well-established windows - icons - menus - pointers (WIMP) interaction paradigm and the desktop metaphor were, and still are, dominant in many computer mediated communication and information contexts. This clearly changed in the first decade of this century with perceptual user interface (PUI) concerns (Turk, 2000) going into interaction R&D activities. Natural user interfaces (NUI) that include touch (and stylus interaction), gesture and speech interfaces are common interaction instruments in nowadays personal computational devices. These are the terminal devices that guarantee an extremely effective individual participation (mediation) in the networked infosphere. The ACM Conference on Human Factors in Computing Systems (CHI 2014), a key reference conference on the field, delivered state of the art scientific papers depicting the relevance and applicability of these new interaction paradigms. In the session that discussed computer mediated intimacy and romance Mullenbach (2014) reported on research using touch based sensing and feedback (haptics) technology to explore affective communication.

Other more established input devices, driven by computer vision algorithms such as Eye Camera from SONY⁴ and later Kinect from Microsoft⁵, originally pro-

posed for the videogame market products, are excellent examples of the mid-air gesture interface devices now widely used in diverse technology mediated interaction contexts, e.g. in arts, Fischbach's smARTbox (2012) that integrates touch and gesture devices for interactive art setups, in tourism Giovannella (2013) uses Microsoft Kinect to implement interactive urban environments that integrate smart tourism and learning. This mid-air gesture interface gains some degree of ubiquity because it doesn't need touch to operate, it depends only of a kinesia language to establish an interaction protocol in the infocommunicational context.

In this PUI approach very recent input devices can be seen in figure 2, such as brain computer interfaces Emotiv⁶, the Insight, and eye tracking interfaces Tobii⁷, the EyeX, devices are accessible and ready to integrate future development of personal computational device's operating systems for a still more engaging technology mediated interaction experience.



Figure 2: Tobii's EyeX eye tracking device and Emotiv's Insight brain interface.

Source: Tobii - <http://www.tobii.com> and Emotiv - <http://emotiv.com/>.

Such plethora of concepts and artifacts are proving to have the power to transform all aspects of the human ecosystem. This transformation has not only the power to influence the way humans interact with each other but is also having a strong impact on the way we organize our life in society including the reshaping of very basic aspects such as the power relations in family, in politics, in the educational system or in business (Castells, 2009a).

The explosion of mobile communications in the last decade is making soar the power of information and communication technologies to transform humans' life. The increasing popularity of online social networks is having a strong impact in the social, political and economic fabric, whose effects scientists are trying to study (Castells, 2009a; Castells, 2009b; Castells, 2013) but we are still far from a comprehensive understanding how this new reality is reshaping the self-awareness of our identity and the way humans live and interact in the infosphere (Florida, 2014).

The Social Identity Theory, proposed by Tajfel (1974), states that all individuals are defined by a personal identity, which includes idiosyncratic attributes (temper, skills, etc.), and a social identity that leads to their own classification (and of others) as belonging to certain groups (political affiliation, nationality, religion, etc.), and this membership perception depends on the value and emotional significance associated with the group. Van Knippenberg and Sleebos (2006) argue that the more an individual identifies with an organization, the more the collective values, norms and interests will be incorporated into individual identity. Ran and Duimering (2007) report that the individual's identity is partly shaped by his sense of belonging to certain groups or categories, which demonstrates identities' ability to evolve and adapt. This belonging perception is particularly relevant for brands.

The post-modern Organizational Identity Theory intends to describe the way audiences of an organization (with greater emphasis on internal ones) are underpinned by experiences in the environment and in the workplace. Based on symbolic interactionism, this theory conceptualizes identity as a process and product resulting of interaction: identities are not innate but socially constructed through interaction, so organizational identities are achieved through continuous organizational performance, being discrete and non-permanent since social interactions are continuous (Scott, 2009). Thus, the dominance of a social identity that spans the whole organization seems to bring clear benefits for the integration of knowledge. However, as illustrated by Willem, Scarbrough and Buelens (2008) when the identity (or its perception) is not unique neither consistent, the positive relationship between social identity and the integration of knowledge weakens. According to Yates-Mercer and Bawden (2002), organizations should seek to implement their knowledge management through culture and identity, and the brand is one of the elements that best represents them.

3. Social branding: exploring the power of the networked infosphere in organizations

The *brand* concept is changing. Over the past 50 years, much of the focus on marketing discipline has been in the 4Ps (Product, Price, Place, Promotion), being the brand an ingredient of Promotion (Schultz and Barnes, 1999), through which it has been dedicated great attention to advertising. In fact, the communication approach imposed by marketing tends to be unidirectional and, as such, the brand has been associated to that technique, exclusively and for years.

However, due to the emergence of social media and the evolution of information and communication technologies (ICT), the brand has been redefining itself. The very model of 4Ps has been questioned, namely regarding its adequacy to the present days and to the new paradigms of information and communication. In truth, the consumer has gained power, above all thanks to the latest changes in ICT, becoming increasingly critical and aware of the advertising messages, which makes brands to reshape their strengths.

In the current “information” era, where time and space are being combined in new different ways, and in which satisfaction no longer occurs with the functional product as with the emotion of the overall experience, the most pressing human needs are turning to be expression, expansion, acceptance, belonging, sharing, adventure, freedom and self-development. The individual needs, increasingly, to be part of the processes around him, and the construction of a personally significant brand is definitely one of those processes.

In 2006 the brand is associated to the Open Source (OS) model, by Pitt, Watson, Berthon, Wynn and Zinkhan (2006). In the perspective of the authors, the OS movement represents a paradigm shift in organizational branding, as the power and control of the brand are now “decentralized and heterarchical”. Almost simultaneously, emerges the concept of Branding 2.0, naturally associated with the so called Web 2.0. According to Bass (2007), Branding 2.0 aims to define a new way of working the brand, integrating it into the digital language and into the new scale of needs, in order to better respond to consumer demand, in the most effectively and personalized possible way.

In 2009, Burmann and Arnhold coined the expression User-Generated Branding, and it means “the strategic and operative management of brand related user-generated content (UGC) to achieve brand goals” (2009, p.66).

The brand is now out of the control it was being subjected by old models of organizational communication; it is increasingly dependent on communication phenomenon Word-of-Mouth (WOM). The average individual is not limited to the user or consumer roles; he is also responsible for the production of ideas, concepts, solutions, any time, under any circumstances, on invitation, or on his own initiative, enjoying a power that has been granted to him: being an active participant.

Today content is a new concern, since those who were characterized as being only consumers increasingly participate in processes of content and experiences co-creation, in many diverse areas (Banks and Deuze, 2009). Brabham (2009) states that one of the benefits of a participatory culture is the value of non-specialized knowledge that becomes part of the creative problem solving process. In fact, “Participatory culture is emerging as the culture absorbs and responds to the explosion of new media technologies that make it possible for average consumers to archive, annotate, appropriate, and recirculate media content in powerful new ways” (Jenkins, 2009, p.8).

Some brands are investing in engaging their most loyal audience. Mercedes Benz USA invited its customers to co-create advertising campaigns, encouraging them to submit pictures of themselves with their objects of desire — their Mercedes vehicles. Such entities are aware that supporting and fostering the collective human capital in existing customers, leads them to real and creative content. Thus, it is urgent that communicative organizations provide to these communities such a system in which users can be assumed as catalyst factors for brand knowledge and creative and human capital, in which these ordinary non-designers users become part of a design process.

The involvement of users in design processes has been discussed and researched since the 70s of the twentieth century. According to Fischer and Ostwald (2002), participatory or collaborative design has been characterized by the development

of solutions, more specifically in the design phase, joining users and designers, to better prospect new contexts of use, and to design, together, the artifacts that users should use.

The development of open systems in which individuals with different abilities, motivations, knowledge and experiences can meet, is a critical factor for the emergence of more creative and sustainable solutions (Giaccardi and Fischer, 2008), namely regarding brands, which are evolutionary systems, that should not remain confined to a set of assumptions or to a previously validated rhetoric. As proposed by Fischer (2003), creativity, in its individual and collective forms, can be easily mediated through computerized systems providing the necessary support to co-creation, enabling an effective, efficient and satisfactory participation to non-specialized users (Lélis and Mealha, 2011, 2012).

That is not, however, the reality of most brand centers, technological infrastructures for organizations to support their brand (or brands). Brand centers are online tools, generally intranets, providing technical information about the brand. According to Lélis and Mealha (2014), online brand centers tend to be closed repositories, controlled by intermediate or top management, and in which learning takes place through acquisition and not through experimentation. These systems do not include the purpose of supporting co-creation of new brand artefacts neither the sharing of knowledge and brand-related ideas. Brand centers aren't, therefore, ecologies adapted to the increasing participatory attitude.

This way, such ecologies should focus not only on existing commonalities and brand graphic codes and rules, but also on:

- providing mechanisms that enable participants to submit brand-related contributions;
- a learning and hands-on environment, allowing participants to migrate the brand consumer/passive user role to the brand power-user role;
- a context in which participants contributions are criticized, recognized and rewarded

In this perspective, 1) ICT, observed as enhancers of new inclusion, participation and development scenarios, 2) the context of user-centered and participatory design approaches, 3) the support of an online community (Preece, 2000) and 4) the implementation of Social Web interaction paradigms, seem to be appropriate to support an online Participatory Brand Center® (PBC) regarding the involvement and participation of highly heterogeneous brand users.

Such framework will need an educational dimension that will sensitize users to the brand knowledge they possess and (still) don't share; also, users must realize that they can make their own contributions, which does not happen yet because they are used to unidirectional approaches, accessing prebuilt models (templates). Thus, this instructional approach should promote, above all, informal learning, through the involvement of users in what defines the brand, both implicitly and explicitly. Participants must contact with the brand guiding principles, which should not be seen as rules because rules are typically prescriptive and describe what can and cannot be done, while guiding principles are interpretable and flexible (Harris, 2007). The instructional approach will provide the space and tools for brand-related design experiments, so that users can, if they want to, individually or collectively, propose new brand artifacts. They will also be invited to participate in evaluating procedures for the assessment of contributions made by every community member. Transparent processes guarantee they will have a very specific idea of the value of their own contribution (both in brand artifacts creation, as in evaluating others' brand artifacts proposals).

A PBC low-fidelity prototype was produced in order to validate such assumptions. It was intended to address, primarily, the participation needs of employees working in service provider organizations, such as universities. Thus, a case study research was conducted in the academic context of the University of Aveiro, in Portugal.

Academics are especially rich in tangible ideas for the brands that represent their universities: they establish numerous contacts, they present results worldwide, they exchange artefacts and souvenirs, collecting merchandise pieces from the many different meetings in which they participate. Typically, they are critical and like to have their opinion heard at the institutional level. Therefore, they seemed an interesting public for this study. Moreover, the University of Avei-

ro's logotype and signage systems were recently changed, leading to inconsistent brand usages by employees, either teachers or non-teaching staff.

In the context of a PhD thesis (Cruz, 2014) five focus groups took place, in which participants (teachers and non-teaching staff) were invited to discuss the theme and had contact with the non-functional prototype of a PBC. The main objectives that guided the focus groups were to assess the willingness/motivation to participate in activities that may valorize the university's brand.

It was in the instructional domain that participants found more novelty and usefulness for their work context, classifying its related features as advantages, which largely influences their willingness to eventually participate and use a PBC. In this case, the greatest relevance was related to the experiential feature, in which users can experiment the brand's physical attributes through an embedded image editor, which dynamically signals incorrect brand applications, based on brand's standards. Regarding their own contributions, participants revealed great concern with brand authorship and property, while assuming advantages in the social remix and appropriation logic. They also revealed some skepticism about the consequences of their participation. Besides altruism manifestations, most individuals need to know that their participation will lead to certain individual or collective advantages/benefits, in the short, medium or long term. In other words, the mere fact of publishing an original artefact should be linked to some positive return, to a method of recognition, by the community and/or by who is in charge. When it comes to evaluating others contributions, participants acknowledged the fact that the community evaluation may ease the selection of some brand artefacts, recognizing the advantage of being co-evaluators.

After these academic procedures, the PBC project, under the brand "OurBrand[®]", was acknowledged in the context of three entrepreneurship events. It won the Aveiro Empreendedor contest. The related prize — an immersion program in Silicon Valley, organized and conducted by Leadership Business Consulting — led to the establishment of contacts with a great diversity of individuals and entities, with which it was possible to debate and informally discuss the PBC approach. After that, OurBrand[®] was awarded in the Iberian

Technological Entrepreneurship Course and, quite simultaneously, it was elected semi-finalist in the Building Global Innovators MIT-ISCTE Program.

Such nonacademic environments involved rigorous evaluation processes, which allowed to validate the essential philosophy underneath the proposed PBC, its overall approach and its operative nature. Today, a functional prototype is under construction, and it will be beta tested in real organizational contexts of use. This extremely important phase of any product that aims getting to market competitively, gathers experience on the needs and expectations of business possibilities, in our case, to understand the relevance of customer empowerment in the branding process and how much its worth.

4. Concluding remarks

Information and communication are basic constitutive elements of the human life. The information and communication technologies available in each specific period of history have shaped the way humans organize social life, the types and roles of the institutions and its dynamics. The explosion on the diversity and power of the information and communication technologies that occurred in the last decades is dramatically transforming the foundations of the human society, with strong impact in all the fields of human activity. Authors such as Luciano Floridi and Gilles Lipovetsky have provided reflections on the transformations of human society in an era in which humans not only rely on technologies to enhance quality of life but life increasingly depends on technologies - Hyperhistory (Floridi, 2014), and in which the dramatic increase on human self-determination provided by the information and communication technologies is transforming the way we understand individual, group and societal life - Hypermodernity (Lipovetsky, 2004).

Despite the many and profound transformations of the infosphere in the last decades, the future will most probably unveil unprecedented changes in the way the information and communication technologies influence the organization, dynamics and perception of life in our ecosystem at all levels of human activity. The development of technologies able to deploy affordable and scalable devices and applications able to deal, in the artificial world, with information related to the

senses of taste, smell and touch, will be a major future disruptive breakthrough with unforeseeable effects. Meanwhile, many incremental transformations based on current popular technologies are happening daily creating new life standards for people and organizations.

Such tendency, that will most probably accelerate the social tensions, dramatically reinforces the urgency to bring to the contemporary science an interdisciplinary approach, towards an utopic transdisciplinarity (Morin, 1990), pursuing a comprehensive merging of all the scientific knowledge, with a very special focus on the humanities, the social sciences and the information and communication technologies.

Notes

- [1] IERC – European Research Cluster on the Internet of Things (<http://www.internet-of-things-research.eu/>)
- [2] CERN - European Organization for Nuclear Research - <http://home.web.cern.ch>
- [3] Moore’s Law - Gordon E. Moore, 1965, observed that microchip performance and transistor counts and densities were doubling every 18 months.
- [4] SONY - <http://us.playstation.com/> (Playstation Eye Camera)
- [5] Microsoft - <http://www.microsoft.com/> (Kinect for Windows)
- [6] Emotiv - <http://emotiv.com/> (Insight, brain interface)
- [7] Tobii - <http://www.tobii.com> (Tobii, eye tracking device)

Bibliography

- ACM_SIGCHI. (2014). ACM CHI Conference on Human Factors in Computing Systems.
- Banks, J. and Deuze, M. (2009). Co-creative labour. *International Journal of Cultural Studies*, 12(5), 419-431.
- Bass, A. (2007). Branding 2.0. Retrieved November 2014, from http://www.brandchannel.com/papers_review.asp?sp_id=1318.
- Beedle, M., Devos, M., Sharon, Y., Schwaber, K. and Sutherland, J. (1999). SCRUM: An extension pattern language for hyperproductive software

- development. *Hillside.net*, 1–18. Retrieved November 2014 from http://hillside.net/plop/plop98/final_submissions/P49.pdf.
- Berners-Lee, T. (1989). *Information Management: A Proposal* (p. 13). Retrieved November 2014 from <http://www.w3.org/History/1989/proposal.html>.
- Brabham, D. (2009). Crowdsourcing the Public Participation Process for Planning Projects. *Planning Theory*, 8(3), 242-262.
- Burmam, C. and Arnhold, U. (2009) *User Generated Branding: State of the Art of Research*. Germany: Lit, Münster.
- Castells, M. (2009a). *Communication Power*. Oxford University Press.
- Castells, M., Fernandez-Ardevol, M., Qiu, J. and Sey, A. (2009b). *Comunicação Móvel e Sociedade: uma perspectiva global*. Fundação Calouste Gulbenkian.
- Castells, M. (2013). *Redes de Indignação e Esperança – movimentos sociais na era da Internet*. Fundação Calouste Gulbenkian.
- Cruz, C. (2014). *Modelo para a Valorização Partilhada da Marca: A comunicação mediada por computador como suporte ao envolvimento dos recursos humanos na cocriação da marca organizacional*. PhD Thesis, University of Aveiro. Aveiro.
- Deuze, M. (2003). The web and its journalisms: considering the consequences of different types of newsmedia online. *New Media and Society*, 5(2), 203-230.
- Fischer, G. and Ostwald, J. (2002). *Seeding, Evolutionary Growth, and Reseeding: Enriching Participatory Design with Informed Participation*. Paper presented at the Participatory Design Conference (PDC'02), Malmö University, Sweden. Retrieved November 2014 from <http://l3d.cs.colorado.edu/~gerhard/papers/pdc2002-ser.pdf>.
- Fischbach, M., Latoschik, M. E., Bruder, G. and Steinicke, F. (2012). smARTbox: out-of-the-box technologies for interactive art and exhibition. In *Proceedings of the 2012 Virtual Reality International Conference - VRIC'12*. Laval, France: ACM New York, NY, EUA © 2010. doi:10.1145/2331714.2331737.
- Fischer, G. (2003). *Meta-Design: Beyond User-Centered and Participatory Design*. Paper presented at the Proceedings of HCI International 2003, 88-92, Crete, Greece, June 2003.
- Giovannella, C., Iosue, A., Moggio, F., Rinaldi, E. and Schiattarella, M. (2013). User Experience of Kinect Based Applications for Smart City Scenarios Integrating Tourism and Learning. In *2013 IEEE 13th International Conference*

- on *Advanced Learning Technologies (ICALT)*, 459–460. IEEE Computer Society. doi:10.1109/ICALT.2013.142.
- Floridi, L. (2010). *Information-a very short Introduction*. Oxford University Press.
- Floridi, L. (2014). *The 4th revolution*. Oxford University Press.
- Giaccardi, E. and Fischer, G. (2008). Creativity and Evolution: A Metadesign Perspective. *Digital Creativity*, 19 (1), pp. 19 - 32. Retrieved November 2014 from <http://l3d.cs.colorado.edu/~gerhard/papers/digital-creativity-2008.pdf>.
- Gleick, J. (2011), *The Information*. Fourth Estate.
- Goldstein, S., Mowry, T., Campbell, J., et al. (2009). Beyond Audio and Video: Using Claytronics to Enable Pario. *AI Magazine*, Summer 2009, 29-45, Association for the Advancement of Artificial Intelligence.
- Harris, P. (2007). We the people: The importance of employees in the process of building customer experience. *Journal of Brand Management*, 15(2), 102-114.
- ISO. (1998). Ergonomic requirements for office work with visual display terminals (VDTs) - ISO 9241 - Part 11: Guidance on usability. Geneva, Switzerland: International Organization for Standardization. Retrieved November 2014 from http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=16883.
- ISO. (2010). Ergonomics of human-system interaction - ISO 9241 - Part 210: Human-centred design for interactive systems. Geneva, Switzerland: International Organization for Standardization. Retrieved November 2014 from http://www.iso.org/iso/catalogue_detail.htm?csnumber=52075.
- Jenkins, H. (2009). *Confronting the Challenges of Participatory Culture - Media Education for the 21st Century*. Chicago: The John D. and Catherine T. MacArthur Foundation.
- Lélis, C. and Mealha, O. (2011). *Brand artifacts co-creation: a model for the involvement of creative, non-specialized individuals*. Paper presented at the 12th European Conference on Creativity and Innovation, Faro, Portugal.
- Lélis, C. and Mealha, Ó. (2012). *Learning the organizational brand with computer-mediated communication*, proceedings of IADIS International Conference e-Learning 2012, 17-20 July 2012, Lisbon, Portugal, pp 493-496, ISBN: 978-972-8939-71-7.
- Lélis, C. and Mealha, Ó. (2014). *Brand Experience Oriented Design Environments*.

- BrandTrends, Journal of Strategic Communication and Branding* Vol 6, nº6, April 2014, pp. 618 (available online at <http://www.brandtrendsjournal.com>).
- Licklider, J. and Taylor, R. W. (1968). The Computer as a Communication Device. *Science & Technology*, 21–31.
- Lewis, S. (2012). From Journalism to Information: The Transformation of the Knight Foundation and News Innovation. *Mass Communication and Society*, 15:3, 309-334, DOI: 10.1080/15205436.2011.611607.
- Lipovestky, G. and Charles, S. (2004). *Les Temps Hypermodernes*. Grasset&Fasquelle.
- Lipovetsky, G. (1998). *A Era do Vazio - Ensaio sobre o individualismo contemporâneo* (ed. portuguesa - 2013, p. 309). Lisboa, Portugal: Grupo Almedina.
- Morin, E. (1990). *Introduction à la pensée complexe*. ESPF Éditeur.
- Mullenbach, J., Shultz, C., Colgate, J. E. and Piper, A. M. (2014). Exploring affective communication through variable-friction surface haptics. In *Proceedings of the ACM CHI 2014 Conference on Human factors in computing systems* (p. 10). Toronto, Canada: ACM SIGCHI. Retrieved November 2014 from <http://inclusive.northwestern.edu/mullenbach-chi2014.pdf>
- Norman, D. A. (2002). *The Design of Everyday Things* (3rd ed.). Basic Books.
- Pitt, L., Watson, R., Berthon, P., Wynn, D. and Zinkhan, G. (2006). The Penguin's Window: Corporate Brands From an Open-Source Perspective. *Journal of the Academy of Marketing Science*, 34(2), 115-127.
- Preece, J. (2000). *Online Communities: designing usability, supporting sociability*. West Sussex: John Wiley & Sons.
- Ran, B. and Duimering, P. (2007). Imaging the Organization: Language Use in Organizational Identity Claims. *Journal of Business and Technical Communication*, 21(2), 155-187.
- Rodrigues, A. (2011). *O Paradigma Comunicacional – história e teorias*. Fundação Calouste Gulbenkian.
- Rosengren, K. (2000). *Communication: an introduction*. Sage Publications Ltd.
- Shannon, C. (1949). *The Mathematical Theory of Communication*. University of Illinois Press.
- Scott, C. (2009). Organizational Identity Theory. *Encyclopedia of Communication*

- Theory*. Thousand Oaks, CA: Sage Publications. Retrieved November 2014 from <http://www.sage-ereference.com/view/communicationtheory/n270.xml>.
- Schultz, D. and Barnes, B. E. (1999). *Strategic Brand Communication Campaigns*. Chicago: NTC Business Books.
- Silva, A. (2006). *A Informação: da compreensão do fenómeno e construção do objecto científico*. Edições Afrontamento.
- Tajfel, H. (1974). *Social identity and intergroup behaviour*. *Social Science Information*, 13(2), 65-93.
- Turk, M. and Robertson, G. (2000). Perceptual user interfaces. *Communications of the ACM*, 43(3), 32-34. doi:10.1145/330534.330535
- Van Knippenberg, D. and Sleebos, E. (2006). Organizational identification versus organizational commitment: Self-definition, social exchange, and job attitudes. *Journal of Organizational Behavior*, 27, 571-584.
- Willem, A., Scarbrough, H. and Buelens, M. (2008). Impact of coherent versus multiple identities on knowledge integration. *Journal of Information Science*, 34(3), 370-386.
- Yates-Mercer, P. and Bawden, D. (2002). Managing the paradox: The valuation of knowledge and knowledge management. *Journal of Information Science*, 28(1), 19-29.