

Designing in transition

Empowering bottom-up knowledge in the “space between”

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Abstract: The complexity of connections and relationships that articulate our society has transformed the way we conceive and project the spaces of communication: the rise of the World Wide Web has furthered the development of complex systems to manage information while the hierarchical construction of classificatory systems has guaranteed the first footsteps of the formalization of online knowledge. Notwithstanding, some popular taxonomies (folksonomy) have been growing. These contemporary bottom-up processes inscribe social relationships in networks: they show that every phenomenon is inter-related and that it is possible to manage a sustainable dimension of knowledge by means of a collaborative approach. However, apart from that dimension of connectivity between people, the social role of information must be also considered. This role relates to the de-codification of links, deals, bonds and contamination between the different layers of knowledge involved in everyday life. It is exactly in “the space between” these two different and interrelated worlds that design can find new frameworks of intervention.

The main objectives of this paper are to investigate “the space between” these two dimensions, decoding the idea of hybrid design; to explore which are the scenarios and possibilities for frameworks like WiredBook and Electronic Margin to overcome some limitations of the actual paradigm and to underline how design can collaboratively define new guidelines to sustain and facilitate a bottom-up construction of knowledge in a specific field of application.

Keywords: *Bottom-up design, connected intelligence, cybrid design, knowledge management.*

1. Introduction

Our world is living in a moment of unprecedented complexity, where things are not only changing faster but are also modifying the post-structuralist ideas of stability, security, and equilibrium. The constant growth of information, with its meaningless and self-referent proliferation of images and sounds, causes a sense of emptiness, and creates, at the same time, a “total surround” that transforms the relations between users, data and

media devices. While the cross-fertilization between people, media and information itself inevitably generates confusion and uncertainty, the social and cultural transformations are also opening new possibilities for perceiving ourselves in new ways (Bolter, 1999), and for translating our practices into a paradigm based on the wiredness state of the information. The complexity of connections and relationships that articulate our society transformed the way we conceive and project human spaces: the spaces of communication, dwelling and knowledge. The spread of the World Wide Web in constant growth has furthered the development of evolved and complex systems to control and manage information. These systems have been designed, according to guidelines, to optimize use and retrieval of data, and represent the first step to translate everyday's experiences into a shared world of communication where people can find new deals, particular forms of interaction and different ways of approaching knowledge.

2. Changing taxonomies

Between the multiple perspectives of innovation and development, in order to flexibly codify Internet information, at least two wide perspectives (correlated but with independent variables) have been advanced in a few years: the semantic web (Berners-Lee, 2002) and the creation of ontologies (Davies et al., 2003). Both perspectives allowed for reaching specific results in the field of knowledge management and its declinations.

The semantic web structure is based on ontologies. An ontology is a descriptive, classificatory form that opens and delineates schemes by means of which information will be incorporated and articulated. They are structures able to maintain entities in hierarchical relation and opportunistically "tagged" (Nirenburg and Raskin, 2004). They constitute one of the few frameworks codified for information management that supplies an exhaustive and rigorous conceptual schema by means of which to manage specific relations, rules, dependencies, symmetries and differences. Although different kinds of ontologies have guaranteed a hierarchical construction of classificatory systems, introducing the first steps for the formalization of online knowledge, they should have to be reconsidered if we want to explore future possibilities in a hyper-connected and fluid society: possibilities that can bring, above all, bottom-up management of data classification, granted by communities that select and analyse information (Daconta, 2003).

Notwithstanding, some popular taxonomies (folksonomy), without neither default relationships among elements nor a precise point of departure, have been growing. These non-structured taxonomies developed spontaneous forms of classification and "bottom-up" collaboration that reflect a conceptual model built by users. These contemporary bottom-up processes inscribe social relationships in networks: they show that every phenomenon is inter-related, that nothing that exists is neither self-sufficient nor independent, and that it is possible to manage a sustainable dimension of knowledge by means of a collaborative approach relating to information. This different way to configure information and knowledge management starts to show "the space between" the human practices and their translation into a digital framework of actions and relationship.

3. Discovering the "space between"

The systemic hierarchies of information today begin to transform themselves into folksonomies, starting from a bottom-up perspective of common collaboration (Tapscot and Williams, 2007), to define and classify, by tagging, different kinds of data (Baca, 2000). This perspective has started from a necessity of communication that takes advantage of more suitable prostheses, more versatile instruments and simpler technologies.

If we want to trace the consequences, or the forerunners of this phenomenon, we have to formulate some basic considerations regarding the transition scenario in recent years: people are “inside” the information flow and not only “in front”; users became active parts in the process of knowledge construction and are not only receivers of distributed information; not only messages (contents) are “tagged”, but also objects (media) that deliver contents, and the whole entities involved in every process of information are tagged; hierarchical schemas and univocal classifications are not enough to describe scenarios in constant change.

Considering these points users become not only passive receivers of data but also an active promoters of information in the net, freeing themselves from hierarchies and relational ties: information becomes a moment of proliferation that emerges from indefinite groups (Lévy, 1996) that aggregate and separate themselves according to complex and not measurable phases. The ties that are constructed among statements, terms, concepts and clusters of data born and die at the same time in which the collectives’ attention spots them, rearticulating the capacity, the content and the very labels (tags) that can classify it. Unstable links between pieces of information are developed, as a result of “bottom-up practices of tagging”, that derives from how online communities accept and determine values.

No hierarchical structure can control a process that does not coincide with its own schemes of demarcation and classification, so the outcome of all these processes is a form of semantics that takes shape in attractions and polarities among users, and that rearticulates the very network. We run in to a sort of imperfect semantics, articulated by a bottom-up construction of the data, in which previous heuristic and linguistic models are substitute by processes of tagging, mash-up and syndication, that characterize the projective and unforeseeable collective mass actions of communities in the net (Ciastellardi, 2009). Considering the social matrix that moves people’s aims and the social dimension of information, the problem is to define how these new kinds of web practices can be integrated, with which results, and with which possibilities. This social role relates to the decodification of links, deals, and contaminations between different layers of knowledge involved in everyday life. Every tentative to translate these practices into something able to fit the web dimensions creates a change of perspective and trigger a resistance. The issue is to focus on the space that exist between the two layers of these scenarios: the human layer and the digital layer, distinguished by the two worlds of real life and web interaction. The boundaries of these layers are not clear, and have a sort of space between them. This is the space in which every process of sharing information, knowledge, and practices takes places. It is considered the place of transition, of passage between two different dimensions. We claim that it is exactly in this “space between” these two different and interrelated worlds that design can try to find frameworks of intervention, not only to eliminate the blind spots and the missteps that a transition through this space generates, but also to empower tools and systems for everyday’s users. If the user’s will is to gain knowledge and to participate in its common creation, the role of design is to offer guidelines and project indications to offer a more reliable approach to digital environments, to articulate shared systems of information and devices.

4. Empowering bottom-up knowledge: the cybrid design knowledge management approach

Cybrid design represents a first step to cover all the aspect of relations and interactions in the “space between”. Approaching the concept of Cybrid Design is possible to perform the first steps into an ubiquitous and extended environment for a bottom-up interacting and sharing of information that integrates the anological frameworks into digital environments (Greenfield, 2003).

The concept of Cybrid Design comes from the mother-concept of Ciberdesign (de Kerckhove, 1995), and can be understood as design that combines analogical and digital media, or augmented reality. That is a hybrid situation in which a physical object is connected to the virtual reality: a wired-object, a cybrid object of design.

A wired-object is a hyper-node, an interface to the virtual dimension of the object. This virtual dimension is what is called the 'electronic margin': the virtual place where all the benefits of Internet and of multimedia contents can be managed and customized in relation to the Web dynamics.

For instance, these benefits, inscribed in the product's electronic margin as information and knowledge, can be either about the very object (its process of fabrication, certificates of quality, multimedia files, attributes, etc.) or about the social or personal data that the owner of the object wants to add to the electronic margin. So a wired-object can include professional files, personal information, multimedia contents and so on.

The process of wiring product is a method to establish a bridge between the digital and the analogical dimensions of the product, enabling people to access digital information through popular hi-tech devices and special codes (wired-codes embedded on the objects) that connect the real world with the virtual context. In this sense, the electronic margin is the virtual treasure of an object, which can be achieved directly from the object.

Wired processes adds a specificity to technological convergence, completing the cycle of information between two dimensions: the material and the electronic/virtual. For example, a process to create a wired-object starts with tagging a real object, an environment or a text on paper by means of an evolved barcode (an evolution of the datamatrix code, called w-code or wired-code). With a device provided with w-code reader (mobile phone, laptop, portable console, etc.) we can access the digital variant of the object and its "electronic margin", in which we can browse all related resources and add our own. So, users either can add or browse texts, links, notes, bookmarks, comments, files and geo-referential information, publishing them directly in the platform, assisted by devices and open tools, and without any pre-defined ontological or semantic structure, but only by a bottom-up approach based on their own knowledge.

Apparently, this happens in many platforms, starting from the most famous: wiki. But the difference between a wired system and a wiki system rests on the fact that no data replaces previously added data. New data enriches the electronic margin but does not take the place of existing data. A palimpsest of bottom-up created and collectively shared layers of contents emerge. In this sense the wired approach permits to change the initial structure of the whole system: design offers only the space for a kind of knowledge management, placed in the hands of users.

5. Wiredbook: a cybrid design example of bottom-up knowledge management

An example is the project WiredBook. The main objective of this project is to articulate the network's advances with Western cultural traditions linked to reading. As previously said, we still need to integrate the analogical frameworks into digital environments, and design could find a way to reach this objective developing a new extended environment for bottom-up interaction and information. In order to achieve that it is necessary to technically extend the reading of a traditional paper book and to transform it in a paper interface for computer-aided reading. In this direction the WiredBook system represents a traditional book on paper but connected to wired resources via tag-embedded technologies, that is to say, a traditional book tagged with specific codes that tries to make the most of the cultural intimacy Western culture has developed - as books-on-paper (Ong, 1983) - with the experience of interaction on screen.

A WiredBook becomes a cybrid object of design, offering the interfacing tools to connect traditional paper to the virtual environment. The structure of this system is made out of two parts: the electronic Book (e.Book) and the electronic Margin (e.Margin). The e.Book is a sort of traditional e-Book: it is the book's electronic literal version, a virtual copy of the paper book in all manners similar to the printed copy but accessible to and from the e.Margin. The e.Margin is the virtual place where all the benefits from Internet can be inscribed (the author's process of work, multimedia files, updates and new editions, comments on the book, chats, etc.), as the virtual 'treasure' of the book. Notwithstanding to all these similarities, there are several differences between the concept of traditional paper book, an e-Book and the WiredBook (table 1).

Table 1. Differences between the concept of traditional paper book, e-Book and WiredBook

Paper Book	Electronic Book	WiredBook
Analogic support	Digital support	Hybrid support
Non electronic device needed	Electronic device needed	Multi-devices, not necessary
High emotional rapport	Low emotional rapport	High emotional rapport
Extended distribution	Narrow distribution	Extended distribution
No possibility of expansion of contents (only bibliography and notes)	Predefined limited expansion of contents (apart from bibliography and notes)	Bottom-up organized expansion of contents (trusted or untrusted)
Personal reading and access without specific interaction	Collective reading and possibility of introducing personal changes	Highly interactive collective and connective reading
No possibility of updating	Possibility of updating	Automatic updating, dynamic product

The WiredBook process starts in the paperback that is tagged with a code. With a mobile device we take a picture of the wired-code (a special datamatrix code provided also with an alphanumeric string) or browse the WiredBook website and enter the alphanumeric string. With this code the digital version of the book and the "electronic margin" of the printed text are accessed. The next step is to browse the related resources and add our own. Users either can add texts, links, notes, comments, files and media, uploading them directly in the platform, by means of external links or browse the entire book and all the media items inserted in the e.margin, that is to say, have access to pictures, videos, soundfiles and geo-referentiation. New data enriches the e.Margin but does not take the place of existing data creating a bottom-up and collectively shared dynamic layers of contents.

In that sense the WiredBook system is a bottom-up vehicle to jump from data to metadata because in its core there are no definitive links between people, items and tags. The informational objects (tags) trigger the classification of other informational objects, enabling users to share knowledge contents and their tags in an environment of web togetherness. In such environment open groups are organized in graded folksonomies (from narrow to broad) and can apply without any top-down rules to design their own path of knowledge.

7. Conclusion: a wired approach to design (for) knowledge

One of the most powerful applications of a wired process to improve bottom-up knowledge is connecting paper (text, books, label...) to the digital environment in the web. In the case of WiredBooks there is a transformation of the experience of reading from a one-way to a multiple-way process, that adds a syneesthetic approach with multisensoriality and spatiality to the experience of reading on paper (depth, volume, texture, etc.).

It implies a substitution of the idea of text on paper understood as final product by the idea of discovering and building by ourselves, an opportunity to transform the reading on paper into a lively process that breaks the fixity and linearity of the text, contextualize reading, and contributes to build the e-imaginary of text. All that increases the immediacy of lecture. The integration of paper and electronic dimensions of a book brings the paper book closer to the way the mind thinks. It is a system that favors the externalization of the personal internalized reading (de Kerckhove, 1995), thought processes and shared consciousness. A WiredBook is just an example of how to put in contact different environments, empowering the space between them, linking the analogical and electronic dimensions of technology and also increasing a scope of use for other technologies. Democratizing design implies a deep change in the way we consider interactivity. Democratizing mechanisms should be considered from the first phases of design making if we want to be consistent. Design has the possibility to establish a new rhetoric of project in order to create a dialogue between the social and the technical tissues. This means not only to produce tools or systems to support new scenarios with sustainable models, but also to suggest a vision of a different cultural apparatus, to offer a new way of online interaction, and new points of access to the knowledge.

References and Citations

- BACA, M., 2000. *Introduction to Metadata: Pathways to Digital Information*, Los Angeles: Getty Trust Publications.
- BERNERS-LEE, T., 2002. *Weaving the Web: Origins and Future of the World Wide Web*. Britain: Orion Business.
- BOLTER G. D., GRUSIN R., 1999. *Remedation: Understanding New Media*. Cambridge: MIT Press.
- CAROL, T. G., 2005. *Finding People in Early Greece*, Columbia MO: University of Missouri Press.
- CASTELLARDI, M., 2009. *Le architetture liquide. Dalle reti del pensiero al pensiero in rete*. Milano: LED.
- DACONTA, M., 2003. *The Semantic Web*. Indianapolis: Wiley Pub.
- DAVIES, J., STUDER, R., WARREN, P., 2006. *Semantic Web Technologies. Trends and Research in Ontology-based Systems*. Chichester: Wiley & Sons.
- DE KERCKHOVE, D., 1999. *L'intelligenza connettiva. L'avvento della Web Society*. Roma: Aurelio De Laurentis Multimedia.
- DE KERCKHOVE, D., 1991. *Brainframes. Technology, mind, business*. Utrecht: Bosch & Keuning - BSO.
- DONALD, M., 2001. *A Mind so Rare*, New York: W.W. Norton.
- GREENFIELD, A., 2006. *Everyware. The Dawning Age of Ubiquitous Computing*, Berkeley: New Riders.
- LÉVY, P., 1994. *L'intelligence collective: pour une anthropologie du cyberspace*. Paris: La Decouverte.
- MAIOCCHI, M, LAURENT L., 2002. *Giocare con la complessità*, Milano: Francoangeli.
- MCLUHAN, M., 1964. *Understanding Media: The Extension of Man*. New York: McGraw-Hill.
- NIRENBURG, S., RASKIN, V., 2004. *Ontological Semantics*. Cambridge: MIT Press.
- ONG, W., 1982. *Orality and literacy. The Technologizing of the Word*. London: Methuen.
- TAPSCOTT, D., WILLIAMS. A. D., 2006. *Wikinomics: How Mass Collaboration Changes Everything*. New York: Portfolio.
- WARSCHAUER, M., 2004. *Technology and Social Inclusion: Rethinking the Digital Divide*. Cambridge: MIT Press.