



INNOVATIONS IN MOBILE INTERFACE DESIGN: AFFORDANCES AND RISKS

Innovaciones en diseño de interfaces móviles: potencialidades y riesgos



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Abstract

Mobile media ecology has raised fluid parameters to configure online communication, mainly altering space and time dimensions and, as a consequence of the alteration, the delimitation of the public, private, intimate, and personal spheres dichotomies. Due to this liquid media ecology, full of affordances and risks, Academy has delved into the main areas of tension to be dealt with: the creation of the profile, the digital identity, the different kinds of social media networks, big data, and the digital path. As a result of conclusions obtained from the EU *Feder* project, *Public and private in mobile communications* (2013-2015), we propose an international ethics code for the interface design of apps, webs, and platforms for mobile devices due to their challenging, intrinsic, and specific features and characteristics.

Keywords

Affordances; Ethics code; Ethics; Interface design; Mobile devices; Mobile media; Mobile ecology; Online communication; Risks.

Resumen

La ecología de los medios móviles ha generado parámetros fluidos para configurar la comunicación online, alterando, principalmente, la dimensión espacial y temporal y, como resultado, la delimitación en las dicotomías de las esferas pública, privada, íntima y personal. Debido a esta ecología líquida de los medios, llena de potencialidades y riesgos, la Academia ha profundizado en las principales áreas de tensión con las que lidiar: creación del perfil, identidad digital, diferentes tipos de redes sociales, los datos masivos y la huella digital. Como resultado de las conclusiones obtenidas en el proyecto *Feder* de la UE, *Public and private in mobile communications* (2013-2015), proponemos acordar un código ético internacional para el diseño de interfaces de aplicaciones, webs y plataformas, así como, específicamente, para los dispositivos móviles debido a sus desafiantes, intrínsecos y específicos rasgos y características.

Palabras clave

Potencialidades; Código ético; Ética; Diseño de interfaz; Dispositivos móviles; Medios móviles; Ecología móvil; Comunicación online; Riesgos.

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1. Introduction

Mobile media ecology has raised a series of challenges in online communication concerning the delimitation of the public and private, intimate and personal spheres. Specifically, and because of its close connection to the nervous system and emotions, this ecology allows a wide variety of both overall and personal affordances while, and in accordance to the broad scope of the previous dimensions, a series of worrying risks.

Also, focused on the technologic environment, mobile media ecology offers broader affordances as well as risks. We, the users, find ourselves melded to a state-of-being that is always connected, where we are surrounded by powerful devices and the potential to explore with an ever-changing and unstable 'liquid environment' (confusion, incessant updates, modifications in the policies, in the terms and conditions, etc.) (Serrano-Tellería; Oliveira, 2015; Serrano-Tellería, 2015a; 2015b; 2015c; 2016).

“ We, the users, find ourselves melded to a state-of-being that is always connected ”

Users' management of data and content, as well as the self and social networking, are prominent aspects to consider. On the one hand, scholarly research has reflected on how our online identity and the self are configured and reconfigured constantly because of fluid space and time parameters. It affects how we, the users, handle our public, private, intimate, and personal dichotomies; thus, configuring and reconfiguring its spheres as well. Here, previous studies have stressed how the inner structure of this ecology (the relationship between apps, channels, content management systems, devices, media, networks, platforms, etc.) influences its management. In addition, it also has repercussions on how we, the users, experience our off-line identity and the self. An example of this management challenge is big data and how we, the users, deal with and understand its consequences.

On the other hand, scholars have explored how users deploy a series of different activities simultaneously and expressed doubts about the quality of attention. Research on how users manage the public, private, intimate, and personal spheres has found a relationship between memories and places, a limitation of the impact of users' knowledge on their actions, a strong circumstantial pattern of behavior, a relevance of temporal priority in digital literacy, and a lack of rationality in some attitudes and performances that have become ingrained in users' behaviors online.

Moreover, the online media ecology is framed by the ambiguity and volatility of overall 'personal policies' and 'terms and conditions' which are added specific features and characteristics of the mobile one, the liquidity and mobility of society and technology. Concretely, information architecture, interactivity, interface design, navigability, and usability of all tools, devices, etc. and their relationships ought to be further considered.

Therefore, this article will investigate the concept of 'liquid spheres or constellations' as a way to describe the dissolution of boundaries between public, private, intimate, and personal spheres (Serrano-Tellería, 2015c). Furthermore, the (re)construction of the user profile and the digital identity resulting from both conscious and unconscious activity on the Internet is directly linked to the process of creation and diffusion of data and content. Many times, the users (prosumers) are not aware of this process nor are the authors cognizant of the original content, as new authors –humans as well as machines- cover the relations established between the users, their content and (personal) data, their activity online and the combination of these (Serrano-Tellería, 2015b).

Therefore, there is an urgent need for an international ethics code that guides the interface design of apps, channels, content management systems, devices, media, networks, platforms, etc., especially for mobile devices because of their intrinsic and specific features and characteristics. We, the users, are exposed to great affordances and risks and should be guided in identifying the best.

2. Background

Before the appearance of the mobile ecology, these types of technologies –closely related to the human body and emotions- were previously described by Flusser (1988) as “extensions of the nervous system” when he defined their impact as a revolution: “the human being is seen here as a media user not just as someone who ‘works’ with information (*Homo Faber*), but one who ‘plays’ with information (*Homo Ludens*)”.

“ Scholars have explored how users deploy a series of different activities simultaneously and expressed doubts about the quality of attention ”

In this sense, Deuze (2012) emphasized that media is everywhere and we are immersed “in” it. Thus, we can see how interface design works to dilute the boundaries between human and machines (HCI), incorporating these mobile devices -and their tools- into our daily life by fulfilling our motivations and, at the same time, generating interactions that produce them (Serrano-Tellería, 2014; 2015a; 2015b; 2015c; 2016). Furthermore, liquidity in society was underlined as well by Bauman (2005).

'Wonder, Love, Hate, Desire, Joy, and Sadness': the six primary passions of the soul described by Descartes (1649) are increasingly incorporated into mobile and online –liquid-interface design, altering the way our brain, and specifically our memory, deals with them (Serrano-Tellería, 2015a, 2015b, 2015c, 2016). The best interface is an invisible one, as recognized designers like Donald Norman have highlighted.

Therefore, we, the users, are melded with this liquid mobile and online media ecology, “like a fish in the water” (Deuze, 2012), where it's difficult for us to perceive and clearly ma-

nage our public, private, intimate, and personal spheres. In addition, the constant updates, incessant innovations, and modifications in both the inner structure of technology as well as in the policies, terms, and conditions to protect the users deepen the difficulties.

Also, this difficulty was previously described by **De-Kerckhove** (1998; 2001) when delving into big data, global awareness, and consciousness and following with his concept of 'Psycho-technology': "for the first time in world history, we are speeding toward a new level of consciousness and a new type of connective sphere, private and public at the same time."

Academy has reflected on mobility and ubiquity as key features of the mobile ecology. Thus, we propose 'the human being as a communication portal' as a metaphor to describe how we, the users, deploy all affordances provided by this ecology

2.1. 'The human being as a communication portal'

Since **Wellman** (2001) described: "It was I-alone that was reachable wherever I was: at a house, hotel, office, freeway, or by mail. Place did not matter, person did. The person has become the portal". Academy has reflected on mobility and ubiquity as key features of the mobile ecology. Thus, we propose 'the human being as a communication portal' as a metaphor to describe how we, the users, deploy all affordances provided by this ecology.

In the creation of a common world, reality is not guaranteed by the "common nature" of men, but because all are interested in the same subject (**Arendt**, 1997) where the human condition is defined by attitude and ways of dealing with the human ecosystem (**Elias**, 1980; **Bateson**, 1979; 1991). In the mobile ecology, the available 'hyper-coordination' (**Ling; Yttri**, 2001; **Ling**, 2004; **Ling**, 2008) represents an outstanding structural feature.

Thus, 'the human being as a communication portal' is defined at every moment by the person's attitude and their way of dealing with this ecology (surrounding environment); the public, private, intimate, and personal spheres and their participation in the common space (content of mutual interest, physical and/or virtual space). In altered dimensional coordinates of time and space –liquidity–, the human being becomes the manager of these (constantly changing) spheres. The same action can be considered to be public, private, intimate, and/or personal in the same physical and/or virtual space depending on the specific off/online situation in an ever-changing re-configuration process highly determined by context. Due to these incessant modifications, context is a key parameter.

Heidegger's *dasein* –being there–, in **Castells'** 'space of flows' and 'timeless time' –liquidity– (**Castells et al.**, 2007; **Castells**, 2008) –until another definition of the mobile/online time

appears–, leads to a relationship of existing by producing an appropriation of the physical and/or virtual space that flows and in a time constrained by **Aakhus and Katz's** (2002) 'perpetual contact' –being always on– (**Fidalgo et al.**, 2013) within the 'liquid environment' (**Serrano-Tellería; Oliveira**, 2015; **Serrano-Tellería**, 2015a; 2015b; 2015c; 2016). Therefore, the 'human being as a communication portal' may be dealing 'between liquid and constellations of spheres' (**Serrano-Tellería**, 2015c), moving across the public, private, intimate, and personal dichotomies.

2.2. Main areas of research

To provide an overall perspective of the main concepts that have previously arisen in research, we ought to start with those that have aimed to describe how the self and on/off-line identity is configured both consciously and unconsciously. 'Cellular and nomadic intimacy' (**Fortunati**, 2002), 'modulations of intimacy', 'privatization of public space', 'virtual private space' (**Lasén**, 2015) and 'fluidity of identity' (**Stald**, 2008) describe different dimensions of identity, whereas the 'network and social privatism' (**Campbell**, 2015) the 'core, diverse, weak, and new ties' that may be established. All these concepts share a parameter: the configuration of the various dimensions, spheres, and spaces depends largely on a specific context that is affected as well by mobility and ubiquity.

A 'tutored self' was identified (**Geser; Fidalgo** in **Fidalgo et al.**, 2013) when referring to the state of 'perpetual contact' (**Katz; Aakhus**; 2002) and the users' emancipation from the off/on-line virtual crowd. The 'tethered self' was also linked to the state of 'always on' (**Turkle**, 2008; 2011) in which the 'fear of missing out' –what is going on: activities, content, etc.– appeared (**Turkle**, 2011; **Rosen**, 2013).

Mobile communication may improve several dimensions of freedom and increase our choices in life, while invading personal privacy and causing emotional, political, and technological distress

Mobile communication and devices may improve several dimensions of freedom and increase our choices in life, explained **Katz** (2008), while invading personal privacy and causing emotional, political, and technological distress. These reflections highlight the straight connection between the users' emotion and the liquidity of this media ecology, full of affordances and risks that are amplified by the inner potential of these technologies.

'Big data' and 'dataism' (**Van-Dyck**, 2014), awareness, and critiques of 'quantified self' (**Walker-Rettberg**, 2014), and 'algorithmic self' (**Pasquale**, 2015) were outlined in close relation to how data and algorithms defined the configuration and self perception on/off-line. To add 'mediated memories', 'normative discursive strategies' (**Van-Dyck**, 2007), 'terministic screens' (**Markham**, 2013), and 'normative behavior' (*LinkedIn & Facebook*: **Van-Dyck**, 2013) in which so-

cial media profiles are not a reflection of one's identity or neutral stages of self-performance, nor are they a means of self-expression (Horning, 2014); they are instead the very tools for shaping identities (Van-Dyck, 2013) through 'filtered reality', 'filtered world' (Walker-Rettberg, 2014).

Even more, they are designed by 'architecture of intimacy' (Turkle, 2011), 'disclosure' (Marichal, 2012), or 'exposure' (Serrano-Tellería, 2014; Serrano-Tellería, 2015a) for social media (*The desire for more, Facebook*; Grosser, 2014) and for the mobile user interface (Serrano-Tellería, 2014; 2015a). These delimitative interface designs are specifically configured to increase self exposure and disclosure, highly influencing users' management.

About ethnography of social media developers in Silicon Valley, Marwick's argument and main critique (2013) pointed out that people who are not effective neoliberal subjects are filtered out of these devices and platforms. Fuchs (2014) agreed but also offered a counterpart description of its potential to generate a new type of communism.

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As for cognitive process and technological appropriation, 'continuous partial attention' (Stone, 2002-2004) was mixed with 'multitasking and multiplexing' practices (Starner, 2011). Users carry on a series of activities at the same time and at different levels of attention. In this intermittent behavior, 'invisible audiences' (Rheingold, 2012; Boyd, 2014) –unknown people that may reach content and data both consciously and unconsciously- played a determining and relevant role because of the lack of awareness of its existence. Furthermore, data and content 'spreadability' emphasized this uncontrolled potentiality of how users receive and perceive data (Kawamoto, 2003; Jenkins; Ford; Green, 2013). Once more, liquidity is described by how data flows and how users manage it.

Here, the 'social self' –Marcel Proust- describes how influential ICTs are becoming in shaping our personal identities. Never before in the history of humanity have so many people monitored, recorded, and reported so many details about themselves to such a large audience (Floridi, 2014). Therefore, the freedom to construct our personal identities online is no longer the freedom of anonymity; instead, it is the freedom associated with self-determination and autonomy insofar as users can manage it, as well as the uncontrolled searching of huge amounts of data. The online experience is a bit like Proust's account-book, but with us as co-authors (Floridi, 2014; Fidalgo et al., 2013; Serrano-Tellería; Oliveira, 2015).

“Public by default, private by effort” underlined Boyd (2014); while “Privacy, precisely because it ensures we're

never fully known to others or to ourselves, provides a shelter for imaginative freedom, curiosity, and self-reflection. So to defend the private self is to defend the very possibility of creative and meaningful life” (Preston, 2014). Thus, we insist on agreeing on an international ethical code for mobile and online interface design.

3. The Public and private in mobile communications project

Over a two year period (April 2013-April 2015), various methodologies were applied at *LabCom.IFP, University of Beira Interior* (Portugal). A broad view about Portuguese general uses and habits of mobile technologies was described using a mostly quantitative approach offered by three online surveys about general users and perceptions, personal data, and images. Next, a variety of user actions, behaviors, knowledge, perceptions, and performances were discussed by analyzing the qualitative approach through focus groups as well as interviews in person and by phone. Content analysis was accomplished by analyzing 'Privacy Terms and Conditions' and their interrelation between operative systems (*iOS, Android, Blackberry and Windows Phone*), social media platforms (*Facebook, LinkedIn, Twitter, and Google+*), and applications (*Instagram, WhatsApp, Line, and Vine*) focusing on privacy issues. Another one was focused on user debates and image sharing through *Twitter, Reddit, and Instagram*.

Both digital ethnography and observation ethnography were carried out as well. The former was mostly focused on describing the different strategies developed among the members of a *Facebook* group (carpooling), to which the researcher belonged, concerning types of conversations, levels of privacy, selection of contacts, etc. Meanwhile, the latter was focused on user actions, behaviors, and performances with mobile devices in an open public space, the main shopping center in the city –Covilhã-.

“The liquid space and time parameters described configure and reconfigure public, private, intimate, and personal spheres, being context key nexus to finally delimit them”

The methodologies mentioned were complemented by a hybrid and experimental method developed during a workshop with BA students in Communication. It consisted of writing an essay at the end of the workshop, preceded by an inquiry using open questions. It was based on the consideration of writing as a suitable procedure to discover the participants' internalization and understanding of their cognitive and behavioral processes. The main results of all these methodologies will be further explored (Serrano-Tellería, 2014; 2015a; 2015b; 2015c; 2015d; 2015e; 2015f; 2016; Serrano-Tellería; Branco, 2014; 2015; Serrano-Tellería; Oliveira, 2015; Serrano-Tellería; Pereira, 2015; Serrano-Tellería; Portovedo; Albuquerque, 2015).

4. Conclusions and results

To sum up and offer an overall perspective, we ought to highlight the relevance of context. The liquid space and time parameters described configure and reconfigure public, private, intimate, and personal spheres, being context key nexus to finally delimit them. The same action may be considered public, private, intimate and/or, personal depending on the specific context established, that, at the same time, may change quickly as well.

In this liquid ecology, the relationship between memories and places (localization), the limitation of the impact of users' knowledge on their actions (many times they know about privacy issues but they disregard them), the strong circumstantial pattern of behavior (context), the relevance of temporal priority in digital literacy (immediacy), and the lack of rationality in some attitudes and performances have become ingrained in users' behavior online.

Moreover, all the above is framed by ambiguity and volatility of overall personal policies and terms and conditions, which are added liquidity and mobility of our society and technology itself. Those features are intertwined with Bauman's metaphor of modern life, so liquid life: fluidity, transience, reticula, and the dissolution of defined borders and boundaries (Bauman, 2005; Aguado; Feijóo; Martínez, 2013) in a society where a "curious reversal" has redefined the private sphere characterized by the right to confidentiality as a sphere that has become prey to the right to publicity (Bauman, 2008). Beyond the correlation between the impact of digital technology and digital features of the liquid society –and environment– (which refers to reflections on the acceleration, dislocation, consumption, and role of identity), the mobile ecosystem fits the fluidization parameters of the technological, institutional, and cultural dimensions of the medium previously described by McQuail, 2006 (Aguado; Feijóo; Martínez, 2013).

Conclusions reached from the different perspectives lead to the paradox of dealing with former "solidity" and current "liquidity"

Users' motivation to fulfil Descartes' 'six primary passions of the soul' is overruled their ability to clearly understand either the reflectivity (required time to analyze) or the management of the mobile interface design in every action, further influenced by the ambiguity of the required knowledge. Moreover, the possibility of receiving stimuli of all types constantly influences how priority levels are established in their performance.

Conclusions reached from the different perspectives lead to the paradox of dealing with former "solidity" and current "liquidity". It is reflected both in the user interface design and the content management and performance with mobile devices. This relationship of mutual influence between "old" and "new" media has previously been described by McLuhan in the laws describing the ecological approach method.

In this process of technological appropriation, an increased awareness and idea of the risks that the Internet and mobile communication involve can be observed. However, the same steps forward found a counterpart when consulting users about their general trust in companies and devices and their proven knowledge and subsequent actions. In other words, users generally continued to lack the proper abilities and capacities to manage themselves on/off-line and showed a lack of rationality in some attitudes and behaviors and a gap between their ideas and knowledge and their final actions (even when they know about risks, in the end they behave differently as a result of letting their emotions flow freely). Risks are especially relevant in the mobile ecosystem because of users' close (emotional) connection with their devices. As an example, some users in our study recognized this and preferred uploading images on laptops because they knew that they would be more careful in their selection on a laptop as compared to their behavior on a mobile device.

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Although users in our study deployed a series of strategies to manage and control their privacy –mainly associated with the 'privacy settings' of the applications, devices and platforms themselves, like avoiding synchronization, access to contacts, location, identification tagging in images, controlling member and/or friend requests, and establishing circles and groups to share the information with– they are insufficient. Also, it ought to be stressed that they "felt secure" just knowing that these 'settings' are available, even though these settings are not enough to protect users' privacy, as experts have stated. These cases were outstanding in youths, as expressed in the term 'digital naïves' (Boyd, 2014). An European perspective can be seen in *EU Kids online, Net children go mobile*, etc.

A remarkable observation in our study was that in general users seemed unaware of the implications of these applications, devices, platforms, tools, and media ecology, as features and parameters that shape their on/off-line identities. Users showed an overall ignorance about the differences between profile and digital identity. Greater awareness about the digital path and 'invisible audiences' should be encouraged.

Privacy seemed to flow in a gradation, like waves – following the metaphor of liquidity– in an interdependent process of managing 'awareness' about privacy, which appears to be highly determined by a context that can change or be valued differently.

Here, it ought to be highlighted that there were different notions and perceptions about what privacy is, also bearing in mind that most users' worries were who and how their content and data are accessed.

Then there was a constant negotiation of rules – characteristics also defined for the digital content that showed no clear norms or rules – that was managed in an ever-changing delimitation of the virtual space and time, to add to the various possible considerations about the scope of its context(s) by each user.

Therefore, the configuration of public and private, intimate and personal ‘liquid spheres and constellations of’ within this liquid ecology seemed to be constantly changing, also since the main coordinates and dimensions, time and space, seemed similarly to change. Moreover, the added and supported sub-coordinates and dimensions, such as the context and the audience, seemed to follow the same pattern. This is the reason for describing this process as liquid and for the comparison with the ebb and flow of the waves. In this sense, core challenges may manage that unlimited flow on user data and content as well as repercussions of the same flow in relation to invisible and potential future audiences. Thus, constellations describe all possible spheres that may be formed in this process.

Users showed an overall ignorance about the differences between profile and digital identity. Greater awareness about the digital path and ‘invisible audiences’ should be encouraged

These main conclusions lead to a hypothesis between ‘liquid spheres and constellations of spheres’. They appear to be *liquid* when they are changing ‘state’ and transform themselves into *constellations* when they have been conformed within specific keys.

Their state and process of configuration and reconfiguration may change as quickly as small modifications in one of its coordinates and dimensions: audience, context, space, time, etc.; are introduced. Due to this liquid ecology, full of affordances and risks, an international code of ethics for the interface design of apps, devices, webs, platforms, etc.; may assist and protect the user who is dealing with this liquid ecology, the ambiguity and volatility of personal policies, and terms and conditions..

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