



MEK: Using spatial–temporal information to improve social networks and knowledge dissemination

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ABSTRACT

Most of the projects which envision knowledge dissemination create and use a unique knowledge base, where all items acquired are organized according to a simple classification. This kind of 'centralized' approach shows some inconsistencies in relation to many of the theories about the creation of knowledge and its dissemination. Due to them, distribution and sociability are essential characteristics for the creation and sharing of knowledge. This incoherence partially explains the reason which leads many users into abandoning this kind of system because they have to adapt themselves to a classification and a rigid structure to represent pieces of knowledge. On the other hand, a lot of tacit knowledge and interaction possibilities are lost in this centralized vision. So, based on the advantages of a distributed approach for knowledge dissemination and the improvement of interaction, we designed and constructed the Mobile Exchange of Knowledge (MEK). This approach involves, in a mobile way, the exchanging of knowledge among people who share the same interests. Some issues like ad-hoc networks, social networks, location prediction and distributed knowledge management are also related to the MEK concept. However, to verify how effective our idea is, we conducted an experiment in the geographical space of a university in Brazil where we analyzed the movements of students and also their interest and willingness to share knowledge items.

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1. Introduction

The current revolution in wireless technologies brings new perspectives for communication and interaction in society. New communication and interaction trends began with the popularization of the Internet in 1980s, and took a radical turn with the advent of mobile telephones (1990s), wireless networks, and mobile devices, or PDAs, and notebooks. We can therefore point two new different characteristics on the way people interact, at work or in their free time. First of all, time and space are no longer a problem. People can work and play anytime and anywhere, having just an Internet connection for it. The second difference is that human interactions are easier than in the past, although this is quite often just temporal. You can find and interact with people to help you with a specific problem, or to play, but these interactions are weak and are lost at the end of the task, game or Internet connection.

These points relate to a new phase of life, named cyberculture [14]. Cyberculture starts to involve people and objects in a widespread connection environment: no more access points, but places. Lévy [14] argues that with the spread of the Internet new forms of knowledge and new forms for its distribution emerge and these new forms transform not only the ways in

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which we manipulate information, but it alters society itself. According to Lévy [14], cyberculture is synonymous with this change as it refers to the ‘set of techniques (material and intellectual), practical habits, attitudes, ways of thinking and values that develop mutually with cyberspace’ and embodies ‘a new form of universality: universality without totality’. Morse [21] defines cyberculture in a way that partly corresponds to Lévy’s understanding. She sees cyberculture as an emerging juvenile and thus a predicated rather than a retrospectively reflected phenomenon. Similarly to Lévy, she defines cyberculture as a set of cultural practices enabling us to deal with new forms of information. Escobar’s concept of cyberculture is not explicit, and remains generally contextual [12]. Cyberculture, according to Escobar [12], is defined by its relation to computer and information technologies, which ‘are bringing about a regime of technosociality’, and by its relation to biotechnologies, which ‘are giving rise to biosociality’. These cultural regimes, a kind of discursive and narrative framework, “form the basis for ... the regime of cyberculture”. Escobar sees cyberculture as a cultural mode that involves ‘... the realization that we increasingly alive and make ourselves into techno-bio-cultural environments, structured indelibly by novel forms of science and technology. [...] Despite this novelty, however, cyberculture originates in a well-known social matrix, that of modernity, even if it orients itself towards the constitution of a new order – which we cannot yet fully conceptualize but must try to understand...’ [12].

So, in cyberculture, all use is part of a great network and somehow we are connected in an e-environment. With the development of mobile computing (and its devices such as laptops, PDAs, and mobile phones) this kind of culture and its spaces are extending to a ubiquitous and pervasive scenario. We are in the era of a ‘collective which is distributed’ and the collective is the partial and temporal aggregation of many items. This connection scenario is changing the way people interact with spaces as the world takes some new dimensions [15]. According to Mitchell [18], ‘gradually emerging from the messy but irresistible extension of wireless coverage is the possibility of a radically re-imagined, re-constructed, electronic form of nomadity – a form that is grounded not just on the terrain that Nature gives us, but in sophisticated, well-integrated wireless infrastructures, combined with other networks, and deployed on a global scale’. Ito [12] give us an example of the disconnected scenario found in this wireless network, and specially, on how people are interacting now, ‘... Because of this portable, virtual peer space, the city is no longer a space of urban anonymity; even when out shopping, solo youths will send photos to friends of a pair of shoes they just bought, or send fast-breaking news about a hot sale that is just opening. After meeting face to face, a trail of text messages continues the conversation as friends disperse on trains, buses and on foot, nimble thumbs touch-typing on numeric keypads’ [12].

The most popular and notorious mobile device is the mobile phone. Today, mobile phones have functionalities which have gone beyond the simple telephone call. The modern mobile phone has GPS, photographic camera, and one can see photos, watch movies, listen to music, browse the Web, and send text messages (SMS¹), amongst other features. According to Ito [12] ‘not to have a *‘keitai’* (cell phone) is to be walking blind, disconnected from just-in-time information on where and when you are in the social networks of time and place’.

Based on this scenario our hypothesis is that mobile technologies can be used to disseminate knowledge (in a pro-active way) and improve social networks. People often have the need to search for knowledge when they leave their physical spaces: either in their office, at home, or in college. And it is exactly at this point that the concept of the Mobile Exchange of Knowledge (MEK) enters the arena.

From a MEK standpoint, each individual is a single, however disconnected, knot in a great entanglement of information and knowledge that is freely circulating everywhere but almost never interacting with each other. So it is more than logical that we have to have these knots make contact and exchange information in the most passive and transparent way for the people who will be involved in the process.

This transparent sharing would be possible through mobile devices such as cellular and pocket computers that would be carrying out the exchange of common interests, regardless of their users participating of an active interaction with the involved person, in such a way that, at the end of the day, any participant of a network where MEK is in operation could upload to his/her PC the sum of acquired information and verify the usefulness or not of what was absorbed from other people.

This work was born aiming at the improvement of the way people acquire and share the knowledge they possess so that more people can have increasingly faster access on the subjects they wish to further, making knowledge the most democratic and distributed thing possible.

To give validity to such concept and show the amount of information, of our own interest, with which we cannot make contact in our daily routines, an experiment was carried out with students at the Federal University in Rio de Janeiro (UFRJ), in Brazil, where participants had to fill an online questionnaire where they named their interests, the degree of sharing of such interests (desire to acquire, knowledge possession, willingness to supply knowledge, and no interest in the matter) and some data that would help us trace their ways in time and space (days when the subject has lunch at the university, classes where one studies, what bus stop one embarks on, if one uses the bus or a car, etc.).

To describe this approach, we will be executing the concepts related to the work (Section 2). To demonstrate the validity of this proposal, the experiment was carried out, and its results are explained in this work (Section 3), as well as some application scenarios (Section 4). Related works are also cited and compared (Section 5). We then move onto the respective conclusions and possible future work (Section 6).

¹ Short message service.

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