Mobile Virtual Communities

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INTRODUCTION

The establishment of collective relationships is a native characteristic of individuals. Living in a recluse way cannot be considered part of human nature. Individuals have always been organized in *communities* in which they establish relationships with other individuals, which usually live in one particular area. Proximity among individuals is one of the characteristics that motivate the creation of communities.

Communities are also created when individuals have common interests. Some examples are: religious communities, such as Catholic and Jewish ones; and communities that comprise people having the same job, such as scientific and medical communities. In these examples, the distance among individuals is not an obstacle to the creation of communities, since individuals have common interests. In spite of living in different places, members of these communities have periodic meetings in which collective relationships are established.

The popularization of the Internet after the 1990s along with the well established use of personal computers have allowed the creation of a new form of community, the well known *virtual communities*. They have enabled individuals to communicate through e-mail, forums, instant messaging, and videoconference. People living in different countries have interacted and communicated through Internet enabled personal computers. Distance learning and software users groups such as Linux users and Java developers are some examples of relationships that have been improved by virtual communities.

Mobile virtual communities are the most recent advance in the establishment of collective relationships, mainly due to the progress in mobile devices and wireless communication technologies. Connectivity among wireless mobile devices enables individuals to exchange information and knowledge, anytime and anywhere. These communities are created in an ad hoc way: individuals with common profiles, carrying connected mobile devices, can constitute a community and access/provide information according to their authorization degree. There are various applications of mobile virtual communities, such as workflow management, mobile learning, healthcare communities, personal assistants in academic conferences, and applications for communication among students on campus, among others.

This article introduces the field of mobile virtual communities, describing the main issues that have culminated in the creation of this research area such as the Internet, personal computers, mobile devices and wireless communication technologies. Applications domains of mobile virtual communities and works that support the development of these applications are also presented.

MOBILE VIRTUAL COMMUNITIES

In the book "The Virtual Community," Rheingold (1993) defines virtual communities as social groups whose interaction is mediated by computers. These communities increase the establishment of collective relationships among individuals, since computer-mediated interaction allows creating communities constituted by

geographically dispersed people. In order to support interaction among members of these communities, various computational tools are used, such as e-mail, forums, whiteboard, audio/video conference sessions, and instant messaging, among others.

Rheingold (2003) enumerates some characteristics of virtual communities. He defines virtual communities as:

1. Organized around affinities, shared interests, bringing together people who did not necessarily know each other before meeting online.
2. Many-to-many media. Unlike few-to-many (broadcast) or one–to-one (telephone or SMS) media, virtual communities enable groups of people to communicate with many others.
3. Text-based, evolving into text plus graphics-based communications. For decades, online communities were built with nothing more than unformatted text. Web-based media brought inline graphics, animations, video, sounds, formatted text, and links into the conversation.
4. Relatively uncoupled from face–to-face social life in geographic communities. People communicating worldwide about shared interests most often do not live close enough to meet regularly face-to-face.

It is important to point out the relevance of item one for characterizing virtual communities. The absence of shared interests among participants makes unfeasible the constitution of these communities. The similarity among the preferences of individuals is responsible for the establishment of these groups.

Virtual Communities Evolves into Mobile Virtual Communities

The presence of various *portable* computational devices in our everyday lives is incontestable: mobile phones, notebooks, handhelds, smartphones, tablet PCs, and so forth. All of these devices allow the *connectivity* among their owners through wireless technologies such as Wi-Fi, GPRS, WAP, and Bluetooth. This scenario of mobility and connectivity has increased the establishment of interactions among individuals, allowing the emergence of mobile virtual communities.

Fremaux (2000) considers mobile communities the natural evolution of virtual communities. Mobile communities can be seen as virtual communities to which mobile services are added. In what follows, two important differences between mobile communities and "traditional" Web-based virtual communities are presented (Fremuth, Tasch, & Fränkle, 2003, p. 2):

- Mobile communities can be accessed by mobile devices like mobile phones, smart phones and PDAs. This could lead to a more spontaneous communication in a community.
- Mobile community platforms offer enhanced communication services for their users, made possible by the 2,5 and 3rd generation of mobile networks: *ubiquitous access*, allowing an anytime-anywhere connection to their communities; and *location based services*, through the use of positioning technologies (Hazas, Scott, & Krumm, 2004) such as infrared, GPS, Bluetooth, and Wi-Fi.

Characteristics of Mobile Virtual Communities

In a general way, mobile virtual communities present the following characteristics (Rheingold, 2003):

- Many-to-many, desktop and mobile, always on. Virtual communities and the resources of the Internet are instantly available to people and their software agents wherever people are located—at their desks, in transit, at home.
- Used to coordinate actions of groups in geographic spaces—teenagers swarm in malls, young adults club-hop, activists mobilize on the street.
- Game environments, social arenas, artistic media, business tools, political weapons—like other virtual community media, mobile virtual communities will start with young people as means for entertainment and light social interaction, then diffuse into other institutions.

Two more characteristics are present in applications for mobile virtual communities. (1) These applications are deployed in different *varieties of computational devices*, with different memory size, processing power, and display capability. In this way, such diversity should be considered during the development of software for this domain. (2) This apparent problem is minimized by the use of *information regarding the context* in which individuals are situated. Through such information,