Chapter 5.11
Mobile Community Networks: Evolution and Challenges

Vijayan Sugumaran
Oakland University, USA

Shriram Raghunathan
B. S. Abdur Rahman University, India

K. Vivekanandan
Bharathiar University, India

ABSTRACT

The evolution of mobile devices has opened new opportunities for collaboration and communication. Instant connectivity, portability, rapidly reducing costs, etc. are some of the drivers for this change. Mobile devices have lower processing power, memory capabilities, deal with varying network conditions and the available power is less. Notwithstanding the above, mobile communities have emerged as a significant domain of research in their own right akin to the online (virtual) communities. This article traces the factors contributing to the proliferation of mobile communities and places the mobile community networks in a current and future perspective. An architecture for the mobile community network is proposed and the challenges in implementing such a network are also discussed. [Article cop-
ies are available for purchase from InfoSci-on-Demand.com]

INTRODUCTION

Currently, mobile community networks are receiving considerable attention due to the great strides made in the development of newer generation of hand held devices. The main purpose of this article is to summarize and add to the literature on mobile community networks in three specific areas: a) historical timeline tracing the evolution from communities to mobile community networks, b) typology for mobile community networks, and c) the issues and challenges in developing mobile community networks.

A community is composed of users, a shared purpose and communication systems that enable
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access to the community. Community services enable users who share common interests to join together in a closed user group (community), and have the means to communicate with each other, interact among each other via chat, whiteboards, or messaging services. The key terms are shared interests, communication ability and paradigms of interaction. Due to the steady progress in technologies and processes for information sharing, communication and collaboration, the work environment has gone in the direction of a more technology supported world. The network, internet, mobile devices and the web of people – will become the workplace. Without a doubt, information and communication technologies (ICTs) supporting mobility, context- and location awareness, networking and ambient interaction will play an important role in implementing this change. Mobile computing has resulted in anytime and anywhere access being combined with new forms of interaction and communication which can result in and aid intelligent behavior.

Thus, the community which is a “network of interpersonal ties that provides sociability, support, information, a sense of belonging, and social identity,” becomes a ‘mobile community’ (Wellman, 2005) when it always connects its members regardless of where they go. A mobile community brings together individuals who share a common interest through mobile technology (Hampe, Schubert, & Schneider, 2004). Eventually mobile community networks can supplement social arenas by offering universal channels of accessibility and providing enhanced opportunities for collaboration (Farooq, & Carrol, 2003). In this article, the domain of community networks, its evolution, research challenges and the factors contributing to the rise of mobile community networks are discussed along with examples of experimental works in the domain.

The rest of the article is organized as follows. The next section outlines the prior work in community networks. The subsequent section traces the evolution of mobile community networks from a technological and personal network perspective and describes a timeline demarcating the various phases in the evolution. Then, the next section discusses the typology for mobile community networks taking into account the mobile environments and future applications. Following that, the issues and challenges in mobile community networks along with an architecture for mobile community networks are discussed. The last section summarizes and concludes the article.

COMMUNITY NETWORKS

The terminologies, classifications and a timeline for the evolution of community networks are discussed in detail in this section.

Communities and Community Networks

In general, communities are characterized by a common shared goal, membership, relationships, mutual commitment, actions or accomplishments emanating from the above. Community support systems help communities to form or function by providing a physical and/or virtual space. There is a clear separation from the ‘technologies that help the formation and functioning of communities’ from the ‘communities’ themselves. This separation is articulated by Hagel, & Armstrong (1997). They point out that the impact of computing technology increases exponentially as the communities move from communities of interest and relationships to fantasy communities and transaction based communities where the computing technology is an essential and important aspect.

Community networks are different from communities in that community networks have a broad agenda of using technology to foster social objectives of community cohesion, enhanced education and strong democracy (Schuler, 1994). Community networks are defined as systems that
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