

# SOCIAL NETWORKING ON MOBILE ENVIRONMENT

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## Motivation

- Social networking has been a growing trend among people
  - People can stay connected to friends and other people that have same interests
  - Social networking sites (Facebook Hi5, LinkedIn, MySpace) have gained popularity among internet users during the past few years.
- This motivated us to include interest-based communication as part of the mobile environment and automatizing the group formation for the ease of use.

## Mobile Environment

- An environment essential for mobile communications where the portable wireless devices access data and information services
- Services are more and more offered by the peer devices instead of servers in the Internet
- People use various devices with various networking technologies

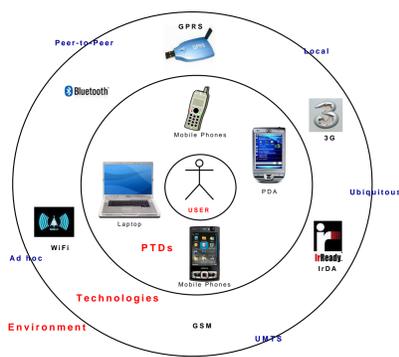


FIGURE 1: Mobile Environment and its aspects

## PeerHood middleware

The PeerHood middleware is software for proactive management, i.e. discovery, monitoring and maintenance, of the mobile environment. The main software components of PeerHood are the PeerHood daemon, library and network plug-ins. The PeerHood *daemon* component uses different network *plug-ins* to proactively search for remote devices and their services. Applications can utilize this service discovery, as well as connection management, through *PeerHood library* interface.

- Network management middleware that works as a personal area network for trusted personal devices.
- Provides a communication environment for mobile devices to act as peers and communicate with each other directly without any centralized servers.
- Includes an application interface, offered by the PeerHood library, that:
  - Enables the usage of Bluetooth, WLAN and GPRS networking technology through a unified interface.
  - Hides the underlying networking structure from the application point of view.

## Social networking on Mobile Environment

By social networking on mobile environment, we mean ad hoc communication enhanced with themes included from the social networking sites, such as interest-based communication, online profiles and friends lists.

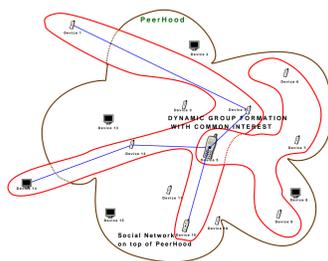


FIGURE 2: Social networking on top of PeerHood

Basic features of Social networking on top of PeerHood:

- Social networking based on interest profiles of each user in close proximity of other users.
- Groups formed dynamically based on interests.
- Uses the application interface and the functionality offered by the PeerHood.
- Upon detection of new devices in close vicinity, interests of users are compared and the users are added to appropriate dynamic groups
- When monitor function of PeerHood discovers that existing device has disappeared, it excludes the user of the remote device from social network

**Dynamic Group Discovery** Automatic formation of a group of users with some similar interests, based on Dynamic group discovery algorithm:

1. Get\_My\_Personal\_Interest\_List(MyInterestList)
2. Get\_Nearby\_Device\_List(RemoteDeviceList)
3. For each myInterest in MyInterestList
4.   myInterest.memberList=NULL
5.   For each device in RemoteDeviceList
6.     Get\_Remote\_Member\_Name(remoteMemberName)
7.     Get\_Remote\_Members\_Interest\_List(remoteMembersInterestList)
8.     result=compare myInterest with remoteMembersInterestList
9.     If result==true then
10.       Insert remoteMemberName into myInterest.memberList
11.     End If
12.   End For
13. End For
14. If View\_Interest(myInterest1) then
15.   Display(myInterest1.memberList)
16. End If

We plan to implement **Semantic teaching** to social networking environment. Users are able to combine two syntactically different, but semantically similar interest terms (for example *biking* and *cycling*). Users can also relate new interests to some existing ones; the environment remembers the defined relationship between various interests.

## Reference Implementation

The reference implementation, PeerHood community, provides the client and the server as a single peer-to-peer application. It registers as PeerHood service, information of which is exchanged through normal PeerHood service discovery mechanisms. PeerHood provides knowledge about the services and the communication framework, the PeerHood community application provides social networking specific functions such as dynamic group formation. Generic PeerHood operation of community application is shown in Figure 3.

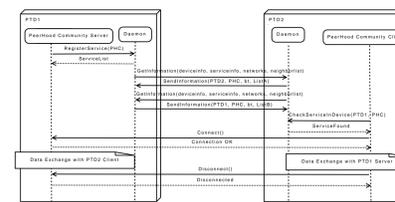


FIGURE 3: Operation of Reference implementation

Features of the reference implementation are:

- Profiles:
  - Add/Edit Profile
  - Add/Edit Personal Interest
  - View All Members
  - View/Comment Other Members Profile
  - View Own Viewers and Comments
  - Support for Multiple Profiles
  - Send/Receive Messages
  - View all Registered Services
- Dynamic Groups
  - Dynamic Group Discovery with Common Interest
  - View All Groups
  - View Members of Group
  - Join/Leave Manually
- Trusted Friends:
  - Add/View/Remove Trusted
  - File Sharing

## Conclusion

**During the research:**

- We studied a mobile environment and its requirements for the development of middleware in the context of social networking.
- Social networking in mobile environment on top of PeerHood was implemented.
- Dynamic group discovery was realized through practical reference implementation

**Future Work:**

- Teaching semantics to the environment
- Performance testing of the dynamic group discovery
- Analyze the efficiency of such dynamic group discovery in any overlay networks.

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