Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Use cases of non-medical BAN applications]
Date Submitted: [12 Jan, 2008]
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Re: [ ]

Abstract: [Introduction for non-medical application of WBAN]

Purpose: [To encourage discussion]

Use cases of non-medical BAN applications

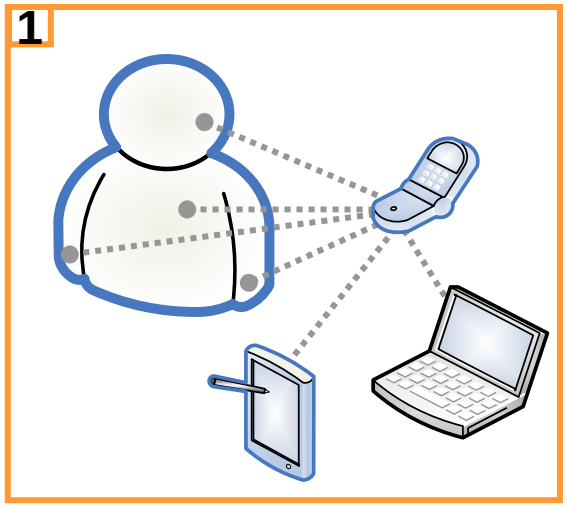
Global Standards & Research

Samsung Electronics Co., Ltd.

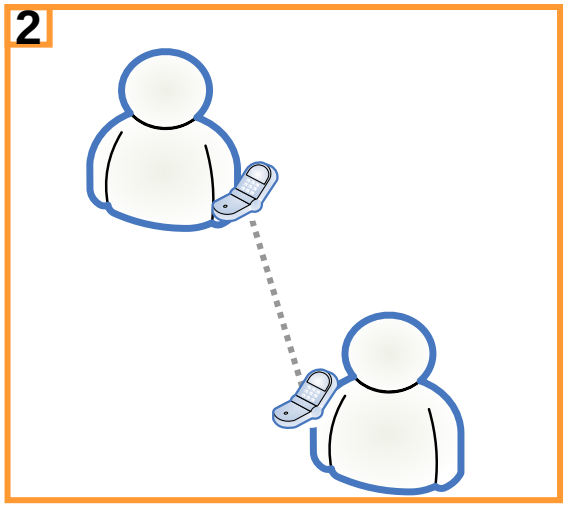
Jan. 2008

BAN Feature

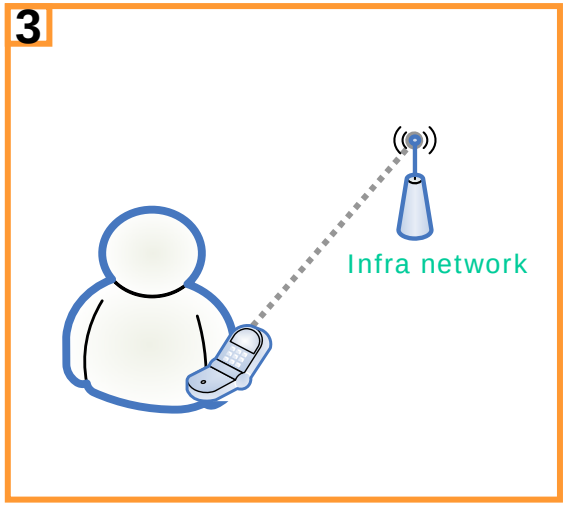
- BAN (Body Area Network)
  - Short range wireless communication (~3meter)
  - Communication with a plenty of sensors or devices
  - Communication with other BAN networks
  - Connection to infra networks
  - Low power consumption for sensors
  - SAR (Specific Absorption Rate) should be satisfied



BAN Piconet



BAN Piconet – BAN Piconet



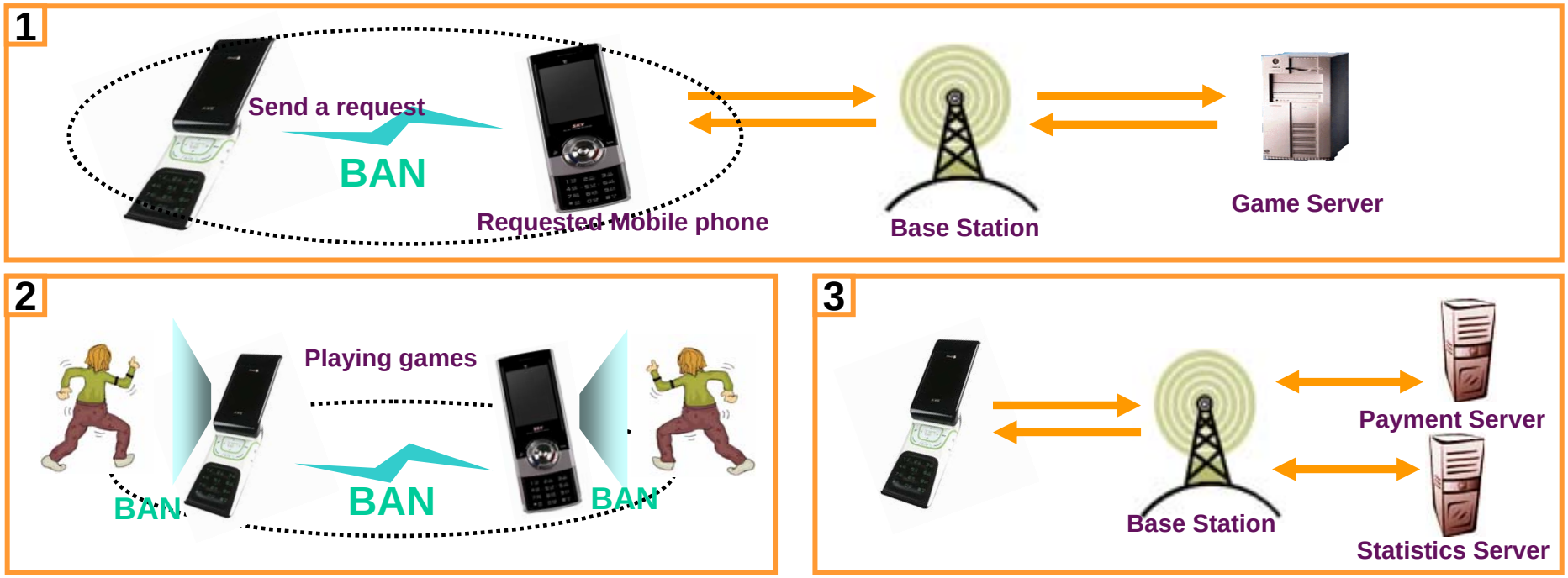
BAN Piconet – Infra network

Requirement

- User / Device Authentication
  - User Information (Subscription Status, Provided Service List, Connected Device List)
  - Device Information (H/W Capabilities, S/W Capabilities)
- Device Management / Provisioning
  - Delivering the appropriate contents to the application device considering its capability
  - Configuration of the application devices for the contents server
- Session Management / Billing / Security
  - The various devices can be connected simultaneously
  - Providing the reliable services independent from BAN technologies
  - Efficient way of Charging and Security control

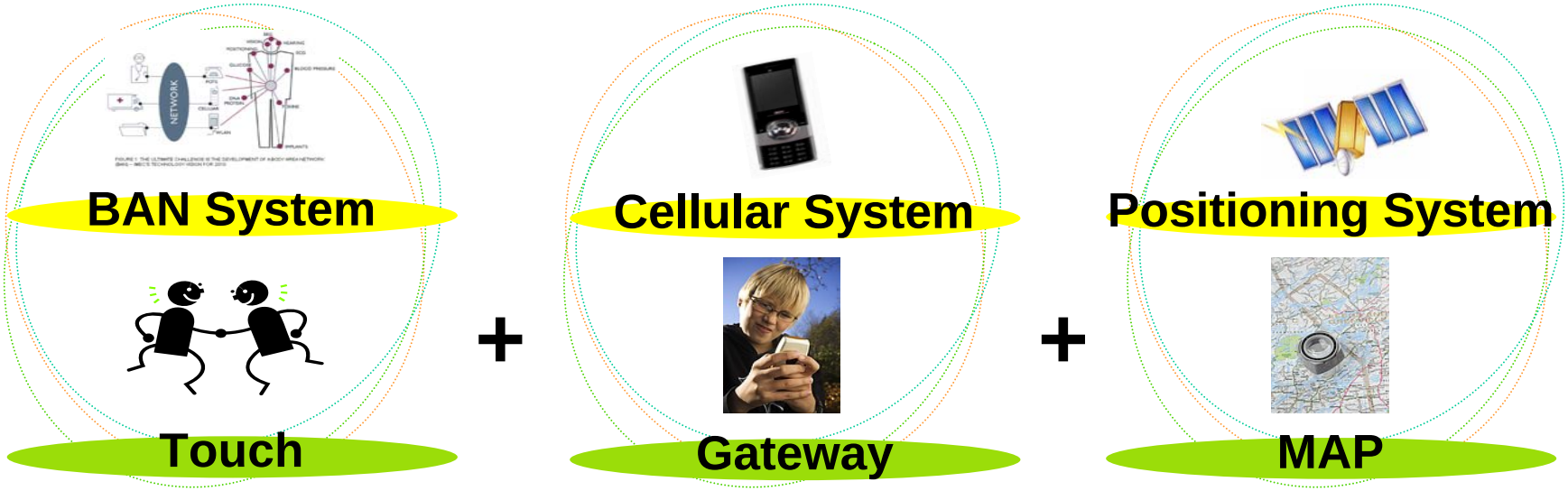
Use-case I : Game (1/3)

- Mobile phone game using BAN
  - 1. Requesting for a game through BAN and downloading it through the cellular network
  - 2. Playing the game through BAN (P2P & connecting sensor)
  - 3. Managing the payment & the statistics of the game (through the cellular network)



Use-case I : Game (2/3)

- Location-based Game



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Location shared, participation of the public

*** CitiTAG : Urban Space Game of iPaq PocketPC**

Use-case I : Game (3/3)

- Requirements

<table>
<tr><td colspan="2">SAR Safety</td><td>Regulatory - Radio</td><td colspan="2">Topology</td><td>Type of data link</td><td>Data rate (per link)</td><td>Number of devices (per piconet)</td></tr>
<tr><td colspan="2">Low</td><td>Compliant</td><td colspan="2">P2P ,
Star (sensor game)</td><td>Asymmetric</td><td>Medium (100-500Kbps)</td><td>Small (<12)</td></tr>
<tr><td colspan="2">Duty cycle (per device) % per minute or hour</td><td>Radio range</td><td colspan="2">Coexistence</td><td>Robustness/ reliability</td><td>Power Consumption</td><td>Autonomy (can it use energy scavenging)</td></tr>
<tr><td colspan="2">20-30%</td><td>< 3m</td><td colspan="2">Yes</td><td>High</td><td>Medium</td><td>No</td></tr>
<tr><td colspan="2">Quality of Service</td><td rowspan="2">Set up time for a new link</td><td colspan="2" rowspan="2">Mobility</td><td rowspan="2">Location awareness</td><td rowspan="2">Channel</td><td rowspan="2">Security</td></tr>
<tr><td>Sensitive to error</td><td>Sensitive to latency</td></tr>
<tr><td>High</td><td>High</td><td><1s</td><td colspan="2">Yes</td><td>No</td><td>In-air</td><td>Med</td></tr>
<tr><td colspan="2" rowspan="2">Form Factor</td><td rowspan="2">Privacy</td><td colspan="2">Power delivery</td><td rowspan="2">Cost</td><td rowspan="2">Market size</td><td rowspan="2">Covered by Other Standards</td></tr>
<tr><td>Battery</td><td>Energy Scavenging</td></tr>
<tr><td colspan="2">Small</td><td>High</td><td>Yes</td><td>No</td><td>Low</td><td>Very large</td><td>Bluetooth</td></tr>
</table>

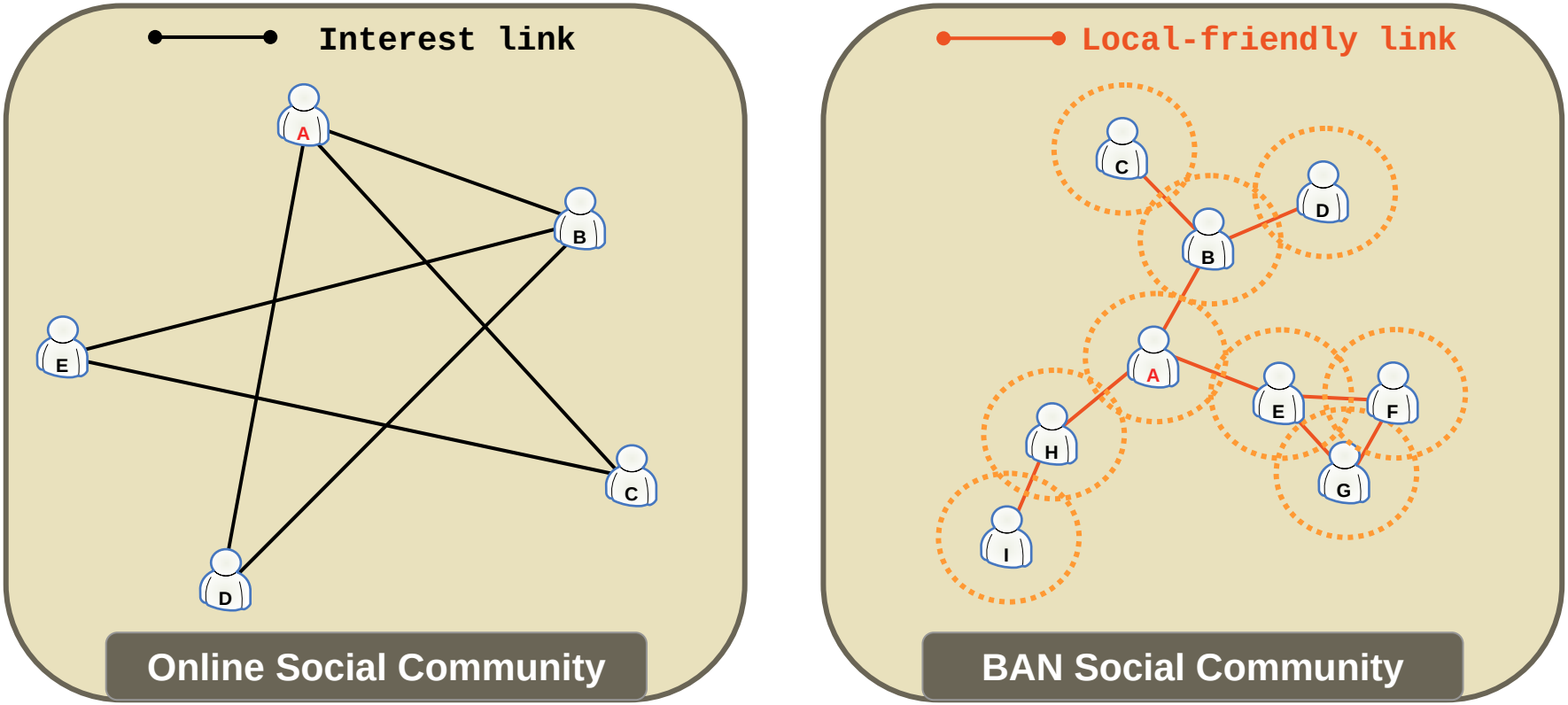
Use-case II : Social Network (1/5)

- Basic Use-case
  - Exchange digital profile or business card
  - Provide Match making
    - Someone with same hobby
    - Game partner
    - Online community member
- Advanced Use-case
  - Manage user-centric human networks
    - Old Market
      - Online SNS (Social Network Service) market (e.g. Cyworld, Facebook) is fatigued
    - Rising Market* (Mobile Social Network Service)
      - Small and close social network (BAN-exclusive service)
      - Group with same preference and emotion
      - Group management in mobile user's point of view
      - Convergence with mobile service and online SNS (e.g. Short messaging and Blog)
      - New service using the social relation or context (e.g. Ads targeted by social context)

*** Yahoo, Google, etc. provide simple social networking service using mobiles.**

Use-case II : Social Network (2/5)

- **BAN Social Network**
  - Network about friendliness : Neighborhood social network
  - Social network consisted of the local-friendly relations
  - Local-friendly link is built up through BAN interaction



Use-case II : Social Network (3/5)

- **Motto**
  - **BAN social network will**
    - help the neighborhood get stronger
    - help people develop friendships in their neighborhoods
    - help people become more civic in their involvement in their communities

- **Benefits**
  - **Easy usage makes social network service market be expanded**
  - **Mobile phone with BAN has a main role for the service**
  - **It make the mixed world : between local social world and virtual social world**
    - It makes more friendly and strong social network
    - It gives additive information over the real world

Use-case II : Social Network (4/5)

- **Reputation system makes the local star!**

Use-case II : Social Network (5/5)

- **Requirements**

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<tr><td colspan="2"><1%</td><td>< 3m</td><td colspan="2">Yes</td><td>Middle</td><td>Low</td><td>No</td></tr>
<tr><td colspan="2">Quality of Service</td><td rowspan="2">Set up time for a new link</td><td colspan="2" rowspan="2">Mobility</td><td rowspan="2">Location awareness</td><td rowspan="2">Channel</td><td rowspan="2">Security</td></tr>
<tr><td>Sensitive to error</td><td>Sensitive to latency</td></tr>
<tr><td>High</td><td>Less</td><td><1s</td><td colspan="2">No</td><td>Yes</td><td>In-air</td><td>Med</td></tr>
<tr><td colspan="2" rowspan="2">Form Factor</td><td rowspan="2">Privacy</td><td colspan="2">Power delivery</td><td rowspan="2">Cost</td><td rowspan="2">Market size</td><td rowspan="2">Covered by Other Standards</td></tr>
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</table>

Thank You !!!

Q & A