Submission Title: [Use cases of non-medical BAN applications]
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Abstract: [Introduction for non-medical application of WBAN]

Purpose: [To encourage discussion]

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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 (~3 meter)
  - Communication with a plenty of sensors or devices
  - Communication with other BAN networks
  - BAN should be connected to infra networks
  - It requires low power consumption (for sensors)
  - SAR (Specific Absorption Rate) should be satisfied
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 / Charging / Security**
  - The various devices can be connected simultaneously
  - Reliably providing the services independently 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

- BAN System + Cellular System + Positioning System

- Touch + Gateway + MAP

- Location shared, participation of the public

* CitiTAG : Urban Space Game of iPaq PocketPC
Use-case I: Game (3/3)

## Requirements

<table>
<thead>
<tr>
<th>SAR Safety</th>
<th>Regulatory - Radio</th>
<th>Topology</th>
<th>Type of data link</th>
<th>Data rate (per link)</th>
<th>Number of devices (per piconet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2P, Star (sensor game)</td>
<td>Asymmetric</td>
<td>Medium (100-500Kbps)</td>
<td></td>
<td>Small (2-10)</td>
<td></td>
</tr>
<tr>
<td>Duty cycle (per device) % per minute or hour</td>
<td>Radio range</td>
<td>Coexistence</td>
<td>Robustness/reliability</td>
<td>Power Consumption</td>
<td>Autonomy (can it use energy scavenging)</td>
</tr>
<tr>
<td>20-30</td>
<td>&lt;3m</td>
<td>Yes</td>
<td>High</td>
<td>Medium</td>
<td>No</td>
</tr>
<tr>
<td>Quality of Service</td>
<td>Set up time for a new link</td>
<td>Mobility</td>
<td>Location awareness</td>
<td>Channel</td>
<td>Security</td>
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<tr>
<td>Sensitive to error</td>
<td>Sensitive to latency</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highly</td>
<td>Highly</td>
<td>&lt;0.5s</td>
<td>Yes</td>
<td>No</td>
<td>In-air</td>
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<tr>
<td>Form Factor</td>
<td>Privacy</td>
<td>Power delivery</td>
<td>Cost</td>
<td>Market size</td>
<td>Covered by Other Standards</td>
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<tr>
<td>Battery</td>
<td>Energy Scavenging</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Low</td>
<td>Very large</td>
</tr>
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</table>
Use-case II : Social Network (1/5)

- **Basic Use-case**
  - Exchange digital profile or business card
  - Match making
    - Hobby
    - Game
    - 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 intimate 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)

* SK Telecom TOSSI service was launched at Dec. 2007
Use-case II : Social Network (2/5)

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

![Diagram showing interest links and local-friendly links in BAN Social Network and Online Social Community.](image-url)
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 use makes social network service market be expended
  - Mobile phone with BAN has a main role for the service
  - The mixed world : between local social world and virtual social world
    - More friendly and strong social network
    - 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)

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<td></td>
<td>P2P</td>
<td>Asymmetric</td>
<td>Low (20-30 Kbps)</td>
</tr>
</tbody>
</table>

- **Duty cycle (per device) % per minute or hour**
  - Radio range: Coexistence
  - Robustness/reliability: Power Consumption
  - Autonomy (can it use energy scavenging)

- **One connection**
  - Less: < 2m
  - Mobility: Mediate
  - Low: Security

- **Quality of Service**
  - Less: < 0.5s
  - Security: Yes

- **Form Factor**
  - Privacy: Yes
  - Power delivery: Battery
  - Energy Scavenging: No
  - Cost: Low
  - Market size: Very large
  - Covered by Other Standards: -