Social Media

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Frictionless Mobile Lifestyle

• Frictionless:
  – All aspects of life are streamlined, smooth, effortless: handle daily minutiae, zero admin….

• Mobile:
  – People are nomadic, available anywhere, not tied to PC, borrowed devices…

• Lifestyle:
  – Improved lifestyle is focus rather than work productivity…
Scenario Space

<table>
<thead>
<tr>
<th>Relationship</th>
<th>School</th>
<th>Recreation</th>
<th>Family</th>
<th>Work</th>
<th>Spiritual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Chat Friend finder</td>
<td>Baseball Team Fan</td>
<td>PTA</td>
<td>Birds of Feather</td>
<td>Church Group</td>
</tr>
<tr>
<td>Formal Team</td>
<td>Group Project</td>
<td>Soccer Team</td>
<td>Finances</td>
<td>Meetings</td>
<td>Study</td>
</tr>
<tr>
<td>Casual Team</td>
<td>Note Passer</td>
<td>Mall Encounter</td>
<td>Shopping</td>
<td>Hallway Chat</td>
<td>Hospice</td>
</tr>
<tr>
<td>Individual</td>
<td>Homework</td>
<td>Movies</td>
<td>Health Mgmt</td>
<td>Organizer</td>
<td>Prayer</td>
</tr>
</tbody>
</table>
Current Pilots

Selection?
- Strategy
- Partners
- Coverage
- Champion
- Ripe technology
“Want to watch this new DVD I just got?”

“Listen to this new single I found at the music store!”

“Somebody help me, I’m bored…”

“Watch the replay of this amazing catch!”

“I need some driving tunes, quick!”
Social Media

• Target market is (pre)teen
  – Desperate to socialize
  – Unable to control physical location (can’t drive)
  – Useful to have a neutral conversation topic (movies, music, and videos)

• Scenario Goals
  – Provide a new social environment
  – Blend physical “room” with virtual “visitors”
  – Share and access my “stuff” wherever I am
  – Easily incorporate multiple physical visitors with many virtual ones
Teens as Consumers - purchase intentions

- Ownership versus a plan to buy.

<table>
<thead>
<tr>
<th>Media Device</th>
<th>Own</th>
<th>Intend</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVD player</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>electronic organizer</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>MP3 player</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Digital camera</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Pager</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Cell phone</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Portable video games</td>
<td>47</td>
<td>9</td>
</tr>
<tr>
<td>Camera</td>
<td>52</td>
<td>9</td>
</tr>
<tr>
<td>computer</td>
<td>56</td>
<td>6</td>
</tr>
<tr>
<td>Video games</td>
<td>57</td>
<td>7</td>
</tr>
<tr>
<td>Portable stereo</td>
<td>61</td>
<td>8</td>
</tr>
<tr>
<td>Telephone</td>
<td>63</td>
<td>8</td>
</tr>
<tr>
<td>Television</td>
<td>71</td>
<td>9</td>
</tr>
<tr>
<td>Personal stereo</td>
<td>71</td>
<td>9</td>
</tr>
<tr>
<td>Home stereo</td>
<td>71</td>
<td>9</td>
</tr>
<tr>
<td>Back pack</td>
<td>73</td>
<td>9</td>
</tr>
</tbody>
</table>

Media Devices a major subgroup
Three Major Parts

• User study
  – Get teens in, learn about them, enlist them to help design applications, etc.

• Global/regional media streaming
  – Scaling, load balancing, delivering streaming video to appliances

• Local/personal media socializing
  – Build smart social space (teen bedroom)
User Study

• **Studying teens**
  – Building on existing studies
  – Building labs team to do new studies
  – Bring in teens to help us brainstorm new applications and ways to simplify them

• **Existing groups in hp**
  – ACO, used outside group to study teens
  – Bristol user studies on audiophiles

• **Mixed group**
  – Some technologists who want to make sure we’re building something useful
  – Some user specialists who want to use technology effectively
Architecture Abstractions

- **Conceptual architecture**
- **Decomposition architecture**
- **Distribution architecture**
- **Physical architecture**
Conceptual Architecture

Ergonomic interaction
- sound
- video
- control
- notification
- status

My Stuff
- music
- movies
- videos
- voice
- preferences
- buddy list
- money

Social context
- presence
- community
- opinion
- recommendation

Interaction
- chat
- share
- comment
- create
- pay

My Stuff - social context - interaction

November 2001
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Conceptual Architecture

Rich media oriented chat
- Investigating Jabber open source chat
- Peer-2-peer chat
- Relationship between chat session and media streaming session

Just at the investigation stage
- Have Jabber source, running servers, clients
- Demo integration of Jabber with Cooltown

Interaction
- chat
- share
- comment
- create

- status

- recommendation
Conceptual Architecture

Frictionless I/O

- Lightweight sensing devices (video/audio/etc)
- Video/Audio analysis and processing to enable frictionless I/O
- Multi-sensor inputs and computations
  - Centralized or distributed processing
  - Local or remote processing (e.g. on sensor/appliance or on hotspot server)
- Technology
  - Video foreground/background segmentation
  - People tracking
  - Low-power, wireless, speech & audio communication for appliances/devices

Ergonomic interaction
- sound
- video
- control
- notification
- status
Decomposition Architecture

Data model
- Authorize
- Social/physical context status
- Metadata
- Search
- Describe
- Archive
- Stream

Computation model
- User initiated (web-like)
  - Create
  - Control
  - Modify
  - View

- Event driven (agent-like)
  - Analyze
  - Notify
  - Delegate
  - Act

- Real-time (stream-like)
  - Render
  - Transcode
  - Capture
  - Synchronize
Decomposition Architecture

Data model

- Distributed cache
  - Universal data name, location independent
  - XML access with media extensions
  - Personal, local, regional caching
  - Global search, archive
  - Similar to I-Shadow w/ app knowledge

- Agile web application
  - Built on data model
  - Web app = URL map, Data, Template plus a bit of Logic
  - Local execution of application when ok, global execution when needed (search)
  - Useful for control abstraction on session, context, aggregation, etc.
### Distribution Architecture

<table>
<thead>
<tr>
<th>Global</th>
<th>Mobile Streaming Media (MSM) Overlays</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seamless media communication to people on any network and on any device.</td>
</tr>
<tr>
<td></td>
<td>• MSM-Content Delivery Network overlay</td>
</tr>
<tr>
<td></td>
<td>• Mobility-optimized caching &amp; streaming</td>
</tr>
<tr>
<td></td>
<td>• QoS-aware streaming</td>
</tr>
<tr>
<td></td>
<td>• Load balancing &amp; predictive resource management</td>
</tr>
<tr>
<td></td>
<td>• MSM-Interactive Communication overlay</td>
</tr>
<tr>
<td></td>
<td>• Live, interactive streaming sessions</td>
</tr>
<tr>
<td></td>
<td>• Real-time media-rich communication</td>
</tr>
<tr>
<td></td>
<td>• One-to-one, many-to-one, many-to-many, P2P</td>
</tr>
<tr>
<td></td>
<td>• Streaming Media Technologies</td>
</tr>
<tr>
<td></td>
<td>• Secure scalable streaming, transcoding, compressed video processing, error-resilient streaming, wireless streaming</td>
</tr>
</tbody>
</table>

- **Regional**

- **Local**

- **Personal**

  - Physical context
  - Aggregation context

  Media Streams
Physical Architecture

Internet

- ISP
- Hotspot Server (local computing)
- Data Center
- Cellular Network
- Surrogates (regional servers)
- Physical context
- Aggregation context
- Adaptors
- IO Appliances
Physical Architecture

- IP-enabled Media Devices in the Home
  - Monitor/speakers, DVD/Cable, Stream dist., Control
- Simple Synchronization & Control Service for Geographically-Separate shared Media
- Technologies:
  - Linux, RTP/RTSP, Java, NTP, MPEG4, MP3, Badge, SIP
- Demonstration
  - Streaming to devices in room
  - Multi-location
  - Distributed Control
  - Sharing Policy
Physical Architecture

- Hotspot server system design:
  - SBC Linux system
  - Local Wireless: 802.11, bluetooth, IR
  - Access Point range price point

- Hotspot server software design:
  - Zero admin
    - Deployment/Management
    - discovery/connectivity
  - software Infrastructure:
    - Enable hosting other services
    - Authenticate
    - Cache
    - session coordination
    - Context-aware services
  - Beacons & Co-Link
  - Connection Diversity
Social Media Testbeds

- Build several “teen rooms”
- Mobile media more than mobile teens
- Drive convergence of research
- Complementary to Streaming Media testbed
- Experiment with distributed apps
  - Chat + synchronized media play
- Bring in teens for app research
  - Early mockup + Wizard of Oz
- Reuse existing work
  - Internet radio
  - Badge 4
  - Streaming media
  - Cooltown beacons
  - Cooltown presence manager
Summary

• Social Media
  – Targeting teens
  – Emphasis on social interaction, using media as backdrop

• Work focus
  – Application: study teens, find cool apps, new infrastructure needs
  – Architecture: build infrastructure that is scalable, reliable, and friction-free