Challenges in Mobile Multimodal Application Architecture

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Outline

• History of Mobile Multimodal Industrial Efforts
• Landscape of Mobile Multimodal Applications
• Challenges
• No Conclusion
History of Mobile MM

- **Industrial Efforts**
  - WAP Forum started to investigate MM in 2000
  - OMA (following WAP) agreed an work item in 2002 (MMMD)
  - OMA completed its architectural work in 2005
  - OMA decided to terminate its work without Tech specs in 2006
  - (Pending termination in OMA)

  MMMD: MultiModal and MultiDevice
Wireless Telephony

- Expecting rapid shift towards mobile data services

Top Subscribers

PC and Mobile In Japan
Landscape

- Capability Improved for MM
  - Increased Network Bandwidth (IMT-2000 users 81% in Japan)
  - CPU and Memory Increased (sub-GHZ, GByte)
  - Linux emerged (LiMo, Open Handset Alliance, . . . )
Retrospective View (general)

- Mobile Data Services need Spiral Evolution
  - Interaction among Services, Content, and End-users
  - Spiral allows gradual capability improvement through use
- Two-Wheel Efforts necessary
  - Capability Evolution
  - Ease of Authoring
- Many believed that mobile fits MultiModal ...
Obstacles in Mobile MM Road

• Challenges in Encapsulation
• Challenges in multimodal Contexts
• Challenges in Content Authoring
Underlying Platforms

- tight-bound-ness to the underlying capabilities
  - failed generalization bypassing the real issues
  - failed design without specific underlying knowledge
  - rapid progress of env threats the higher-layer standardization

- How can we unbind these bonds?
General vs. Specific

• Bridge too far?
  • Single application with multimodal interactions with a user
  • Single application with different modal interactions to different users
  • Single application with single modality with a user at a time (different contexts provide different modal interactions with the user)

• Gap to be filled between general framework and workable solution
• Less support from the PC Internet
Authoring

• Intuitive Difficulties?
• Who are rigorous authors?
• Authoring systems support?
• Authoring is always a pain . . .
  • Obstacles for general MM
  • Obstacles for mobile MM (more authoring and usability test pains)
• Event sequence among multiple entities will be a nightmare
Retrospective View (case)

- Contradicting Observations
  - Sustained Enthusiasm
  - Little or Isolated Contributions
Conclusion

• No Conclusion
• No Silver bullet to the Challenges (seems like)
• Industry will be pleased to see mobile Multimodal Apps