Intelligent Wireless Information Access

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Premises

• Computers as tools for information access
• Ubiquity of wireless platforms
  – Cellphones
  – Pagers
  – PDAs (Palm VII, etc.)
  – Laptops with wireless
  – …. 
Key Question

How do we build services that can intelligently prioritize and deliver information in a wireless world?

How do we deliver information as a function of both content and context?
Three Types of Necessary Information

Devices    User    Information
Device Heterogeneity

Wireless information requires information about the user’s devices

Device *heterogeneity* is very important

- Connectivity characteristics
- Capabilities
- State
Device Connectivity Characteristics

• How is the device connected to its server
  – Always on/“pushable”?  
  – Pagers, cellphones vs Palm VII
• Bandwidth
• Cost
Device Capabilities

What can the client device do?

• “Display” characteristics
  – Text, audio, images, video, etc.
  – Screen size, resolution, etc.

• Local storage? Maximum item size?

• Processor speed

• Ports? (Infrared? BlueTooth?)
Device State

- Battery strength
- Remaining storage
- Connected?
- Price per byte
User Information

Intelligent information access requires information about the user

• User context (e.g., location, time)
• User model (learned vs provided, content-based vs collaborative, device-specific vs device-independent, short-term vs long-term)
• User feedback channels
Information Information

- Data type (text, images, video, audio, etc.)
- Authorship
- Date of delivery
- Other recipients
- Coupled information sources
- …
Recent Research

• iValet: Information Valet
• Learning wireless email reading behavior
• Learning important financial newswire stories from news stories and coupled financial data: Sofus Macskassy presentation this afternoon
Information Valets (iValets)

A framework for intelligent information access to information from a range of platforms for a range of information services

iValet: the central conduit for accessing and manipulating information:

– iValet interacts with user via multiple client devices
– iValet interacts with multiple information resources

Understands heterogeneity of information and devices
iValet Framework

Client Devices
- Desktop PC
- Connected Organizer
- Two-way Pager
- Cellphone

Information Services
- Email
- Web Content
- Documents
- Printing Faxing

Etc.

Etc.
Design Goals

• Incremental addition of devices
• Incremental addition of information services
iValet Architecture

Diagram showing the architecture of iValet, with modules for User Profiles, Device Profiles, and Info Profiles connected to front and back end APIs.
The Rutgers iValet

• **User devices:**
  – RIM 950 two-way pagers
  – Palm VII

• **Information services**
  – Email
  – Web
  – Files
Front Ends

RIM 950
  • BellSouth Wireless Data Inter@ctive Paging Service
  • Communicates with iValet via email

Palm VII
  • Web-based front-page
Back Ends

- Reading, writing, and searching email
- Searching files by name and content
- Text-based URL browsing
- Printing
Rutgers iValet Core

• Allows cross-device functionality
• Location where *intelligent* wireless information access happens
Learning Users’ Wireless Information Access Preferences

• Can we predict what to do with new incoming information?
• What kinds of user feedback can be helpful?
• What context helps with learning user preferences?
• What learners are well-suited to this task?
• Earlier IABs
Learning to Exploit Multiple Information Sources

• How can we learn to prioritize one source of information by correlating it with a second source?
• How do we resolve multiple information sources with a user’s preferences?
• “Intelligent Information Triage”, Sofus Macskassy, later today
Summary

• Information Valets as a framework for multi-platform intelligent wireless information access
• Learning has the potential to model users’ information-access preferences
Future

Location-based services
More wireless services
More devices