



IBM Research

Electronic Chronicles: Empowering Individuals, Groups, and Organizations

Gopal Pingali

Pervasive Computing Solutions

IBM T.J. Watson Research Center

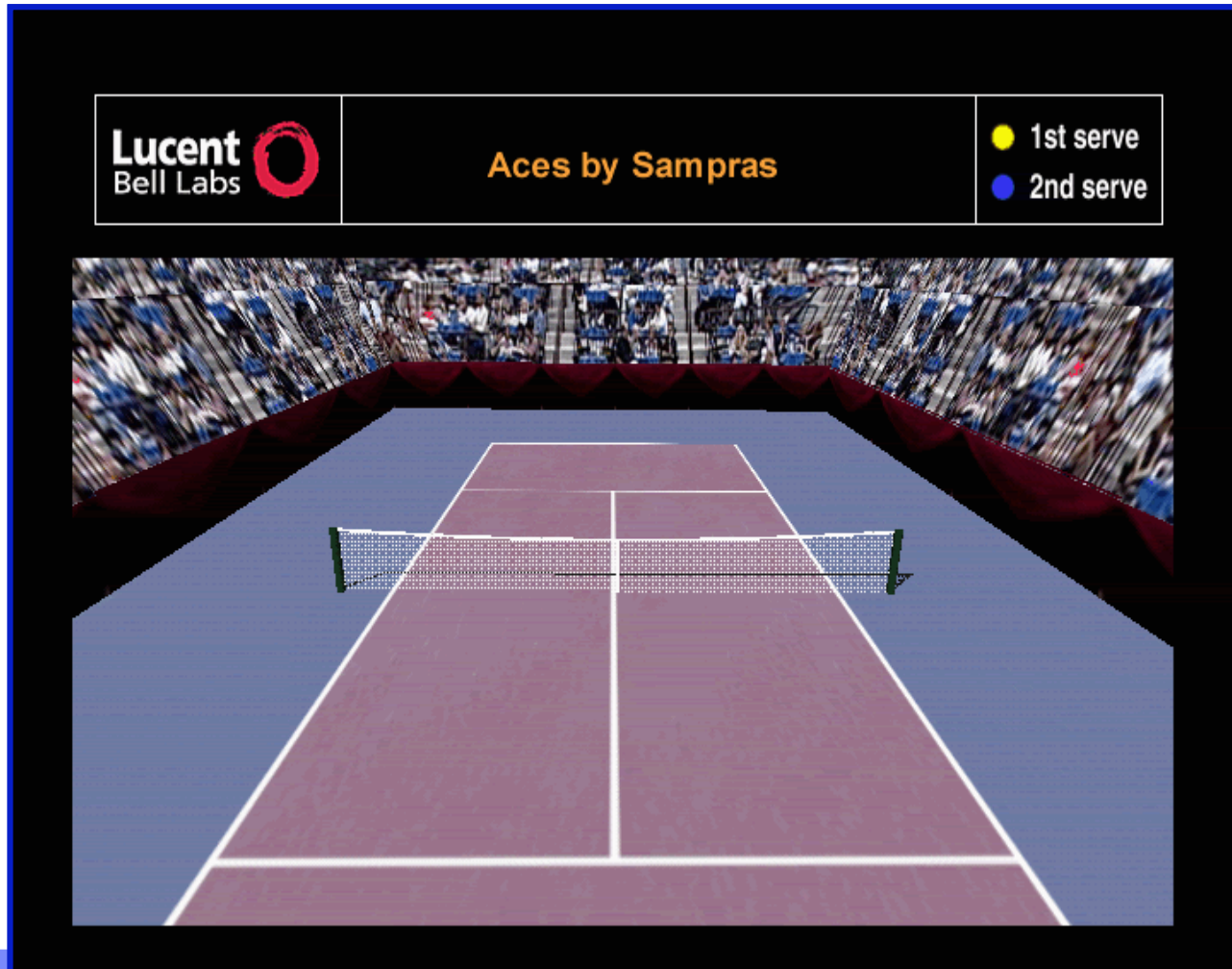
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Agenda

- Introduction: Traditional chronicles vs Electronic Chronicles
- Motivation for Electronic Chronicles
- Applications of eChronicles
- Video Chronicling: **Customer Activity Analysis, Smart Surveillance**
- Chronicling tools for the Enterprise: **PICASSO**
- Personal, Group, and Organizational Chronicles
- Chronicling in the Mobile Era
 - Applications in Army Operations: **EC-ASSIST**
- Research challenges in electronic chronicles
- Conclusions

ATP World Championship 1999



US Open 2000

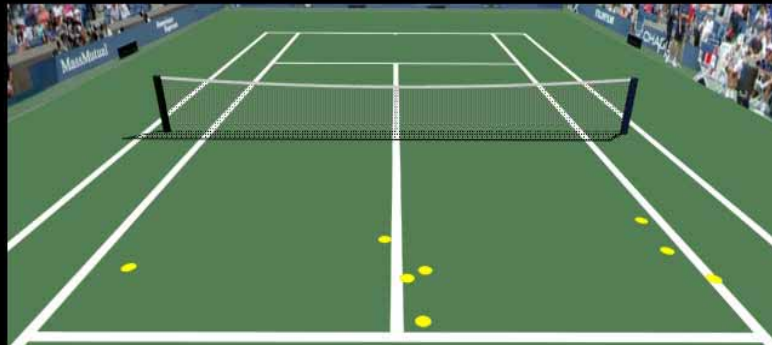
US Open 2000 final: V. Williams def. Davenport 6-4 7-5

Lucent
Bell Labs



Aces by V. Williams

● 1st serve
● 2nd serve



Set 2 3-2 Game Williams

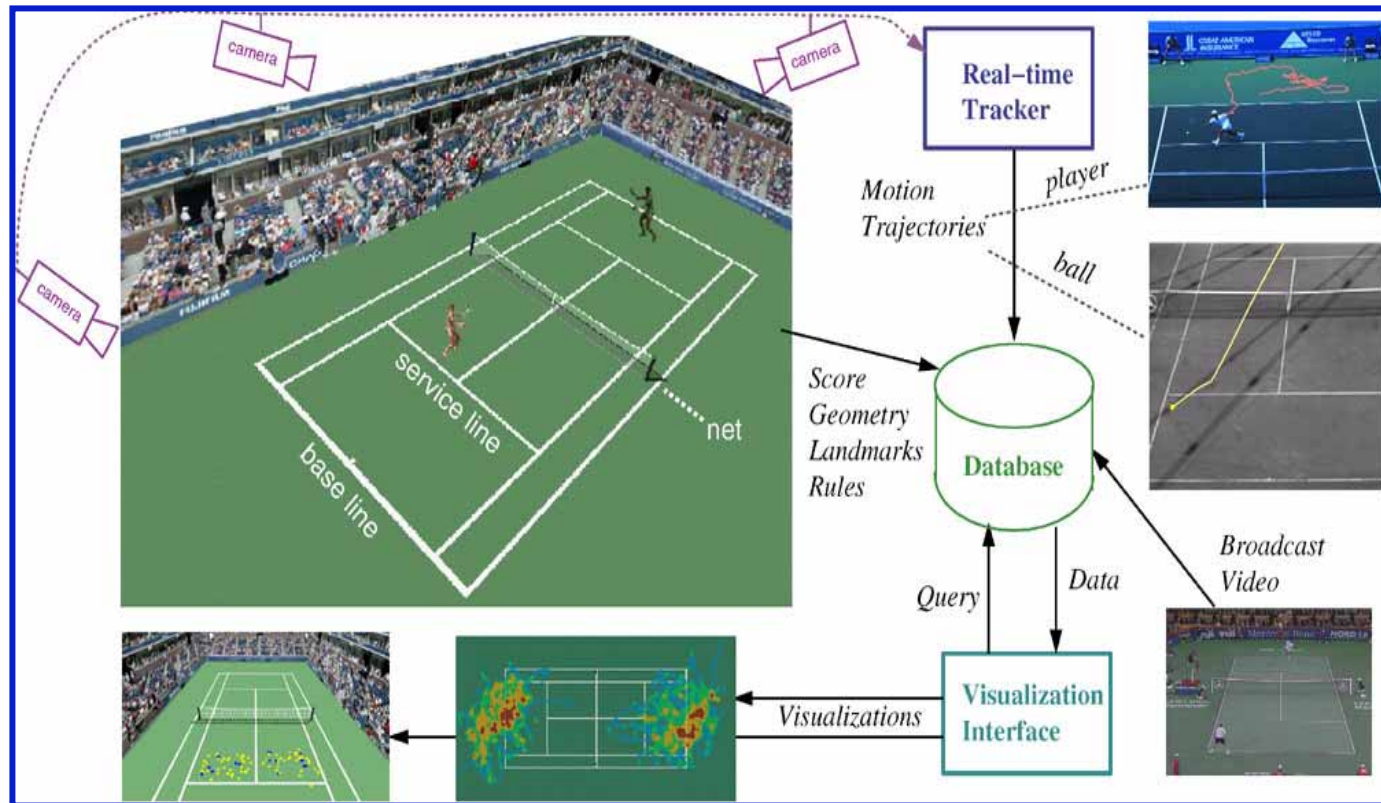
Set 1 1-3 15-0

Set 2 4-4 40-0

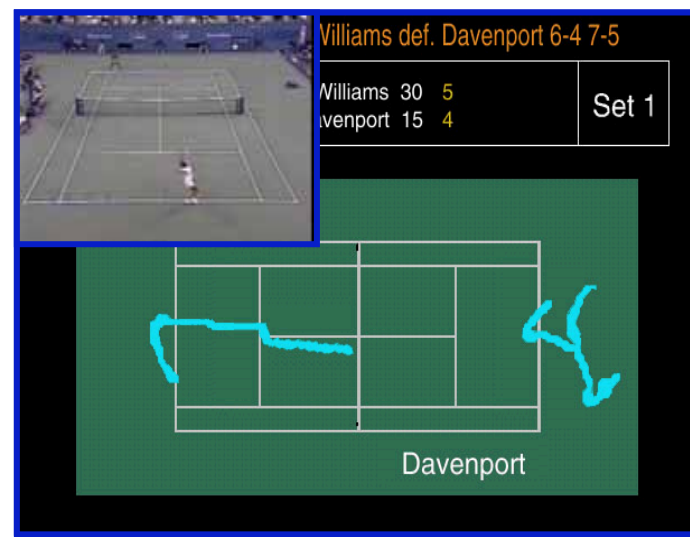
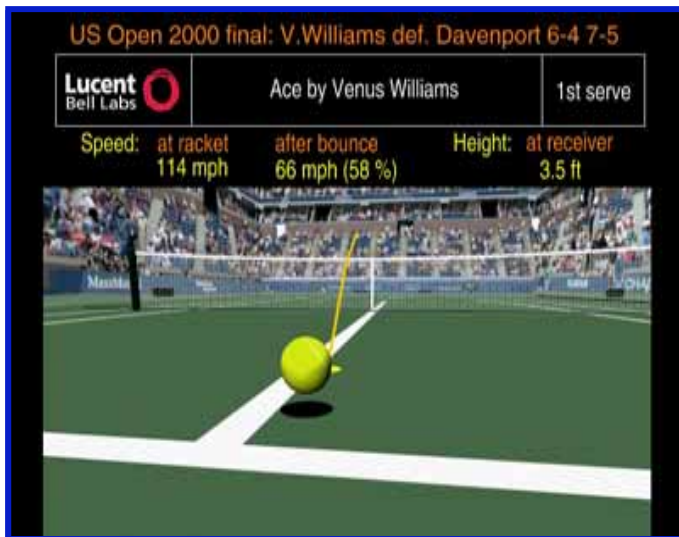
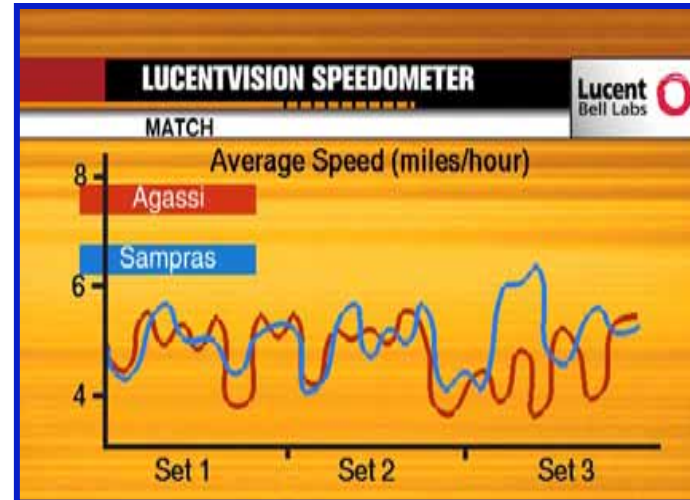
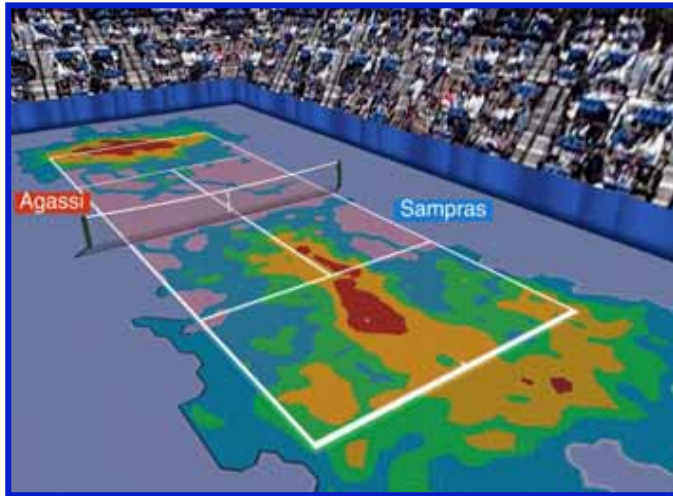
LucentVision

- *Analyze and capture* real world activity into digital multimedia database -- instantly indexed
- Enable interactive *visualization* of the activity – live or archived
- Provide *access* over a variety of devices – TV, PC, cell phone, special tablets etc.

in *real time*.

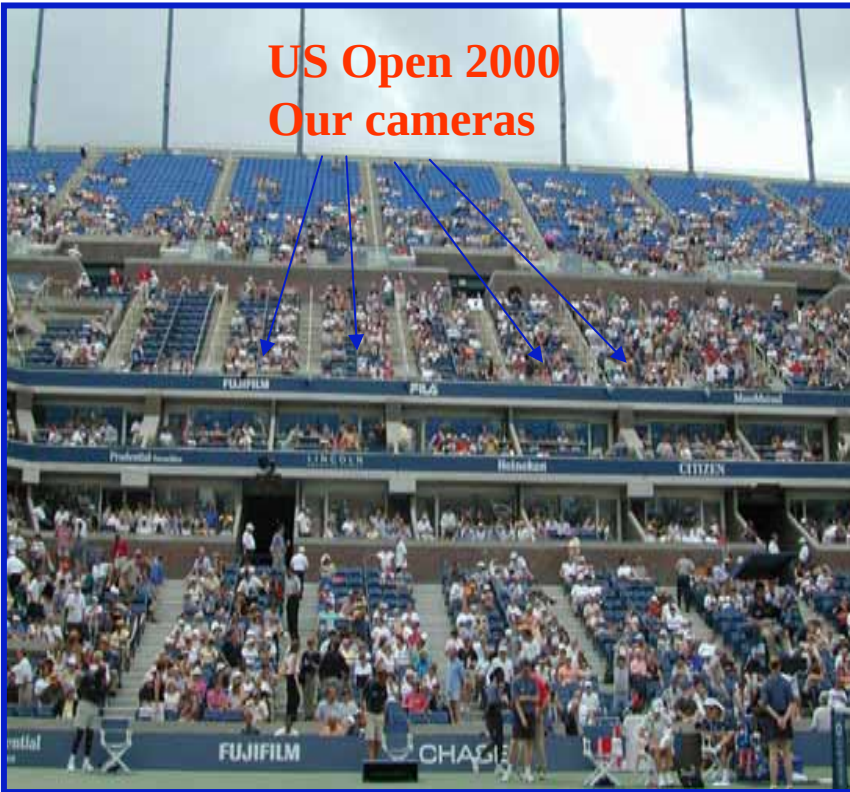


Visualization, Mining, and Retrieval



Proven Record

US Open 2000
Our cameras



Used in more than 300 ATP and US Open matches.

Highlights

- Analyze 150 MB of video per second (from 8 cameras)
- Store/transmit compact summary--trajectories (only few KB/match)
- Track players and ball in spite of wide variations in lighting
- Track fast (speed up to 225 km/h), small (67 mm diameter) tennis ball

Broadcast by 25 TV networks to 100 countries.

Themes from LucentVision demo

Different way of recording an activity – a new kind of chronicle

- Rich capture of activity
- New media analytics: driven by emerging sensors
- Contextual organization of information
- Personalized Access, Search and Mining
- Experiential Interface
- Access Anywhere
- Notifications and alerts
- Evolution of existing applications

Electronic chronicles

- Go beyond mere diary-like partial reports of what happened
- Create rich multimedia records in real time
- Searchable, shareable, discoverable, visualizable, and instantly actionable.

Chronicles and Context

Chronicle:

- An extended account in prose or verse of historical events, sometimes including legendary material, presented in chronological order and without authorial interpretation or comment.
- A detailed narrative record or report.

Middle English cronicle, from Anglo-Norman, alteration of Old French cronique, from Latin chronica, from Greek khronika (biblia), chronological (books), annals, neuter pl. of khronikos, of time.

Context:

- **the set of facts or circumstances that surround a situation or event; "the historical context"**
- **That which surrounds, and gives meaning to, something else**
- **\Con*text\", a. [L. contextus, p. p. of contexere to weave, to unite; con- + texere to weave.] Knit or woven together; close; firm.**

Motivation for eChronicles

- Pervasive nature of information today.
 - Information explosion due to digital sensors, storage, networks, and processing
 - Exabytes of storage soon on personal devices
 - Extending across all spheres of life and businesses
 - Offices, Homes, Automobiles, Retail Stores, Hospitals, Stadia
- The big challenge: delivery of information relevant to the context
 - Improved context capture and modeling
 - Pervasive delivery
 - Deep integration into business process
 - Emerging challenge of unified contextual organization, for contextual search and retrieval

2010 Platforms

	Desktop/ Home	Phone, PDA	Server
Processor	50 GHz	12.5 GHz	50 GHz
Memory	50 GB	15 GB	200 GB+
Storage	3TB	4GB flash, 500 GB disk	5 Exabytes

Applications of eChronicles

- Personal Information and Media Management
- Healthcare
- Security and Surveillance
- Entertainment
- News and historical accounts
- Business Activity Monitoring
- Business Process Transformation
- Employee Training
- Education
- Customer Service and Sales
- Mobile Workforce Management
- Meetings, collaboration, and experience sharing

Example Application: Smart Surveillance

Video Surveillance vs Smart Video Surveillance



Exhibit 2.5. Monitoring video output is a boring task and usually unproductive in most security applications, even for the motivated employee.



Alert – car parked in
loading zone > 5 mins

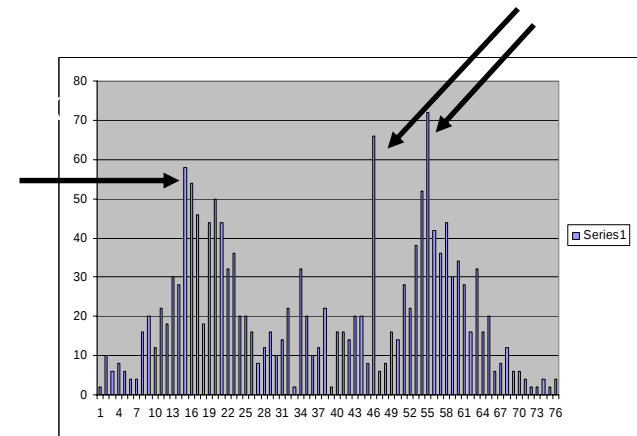
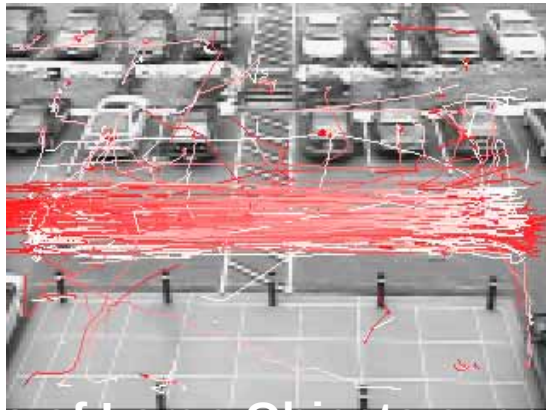
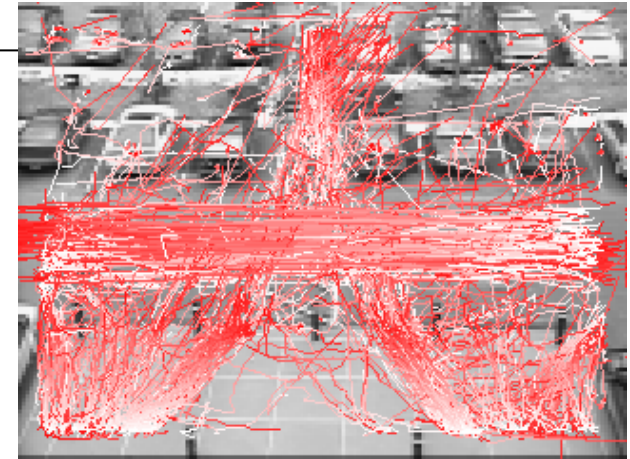
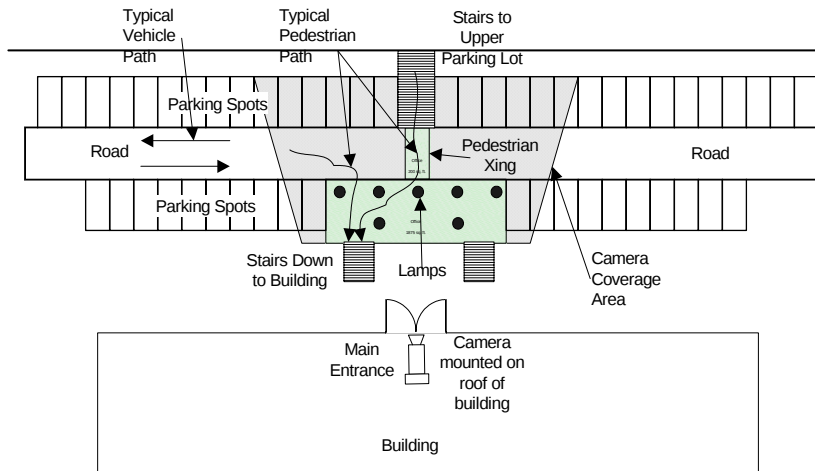


People Tracking for Customer Activity Analysis

- First real-time vision system for people tracking
- One general purpose processor per camera
- Multiple people tracked per camera view
- Hand-off across cameras to cover large area



Long Term Monitoring Results – for 24 hours



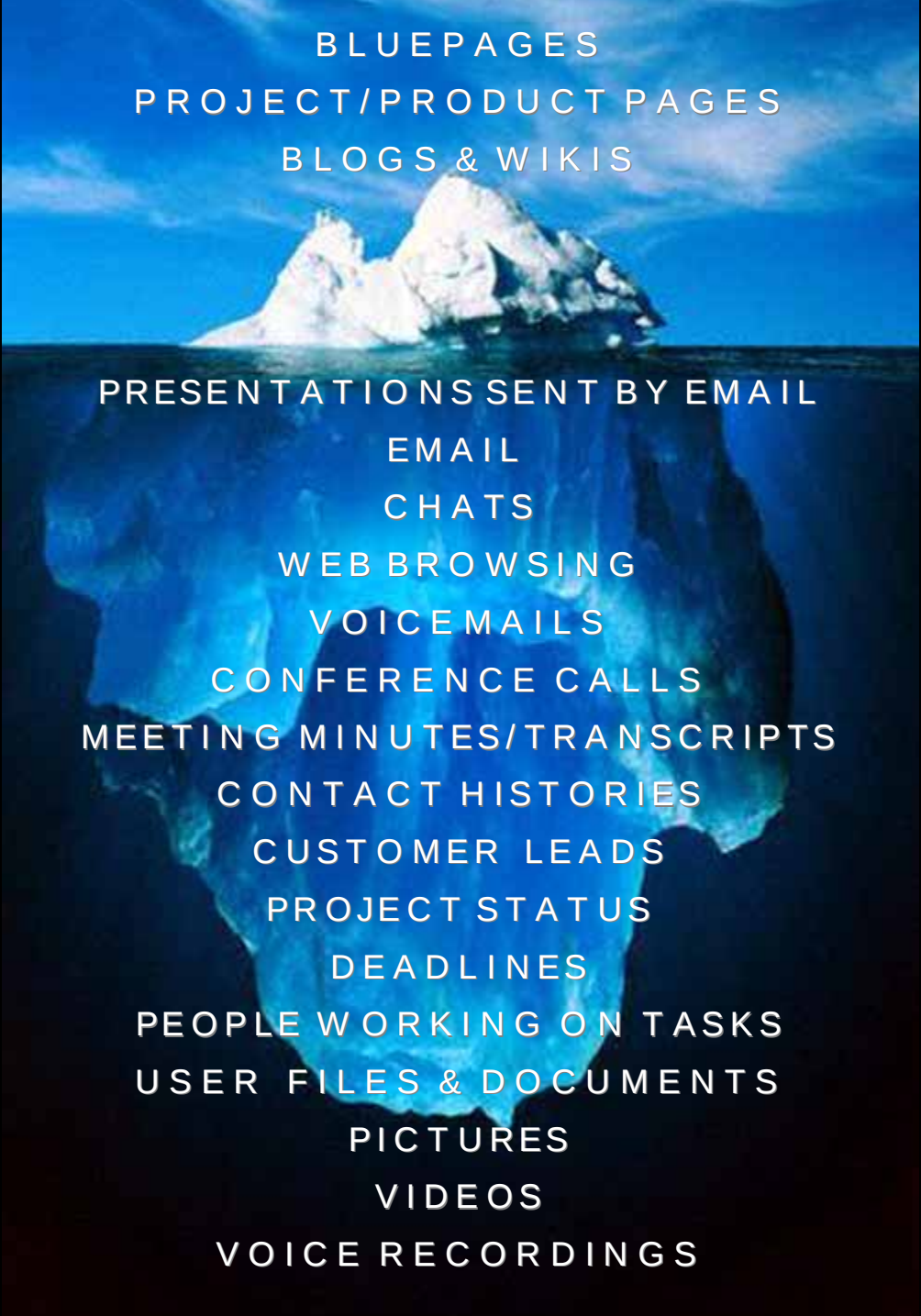
Unified Contextual Organization of Information

PICASSO: Electronic Chronicles for the Enterprise

From Activity Capture to Actionable Intelligence

BLUEPAGES
PROJECT/PRODUCT PAGES
BLOGS & WIKIS



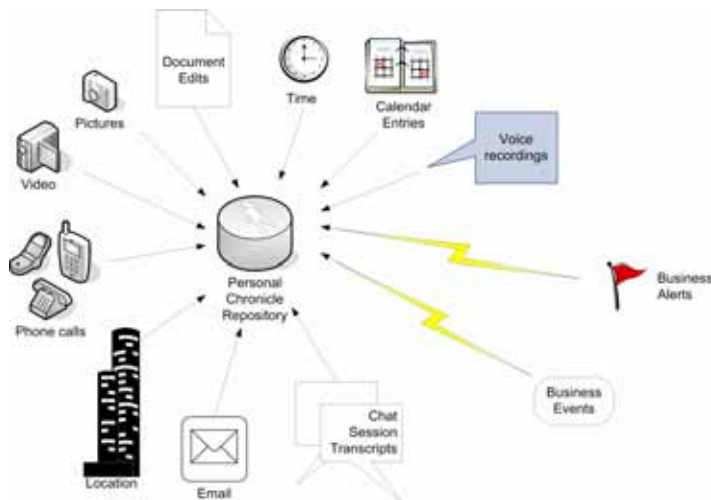
An iceberg floating in the ocean under a blue sky. The small tip above the water represents visible data, while the large submerged part represents hidden data. The text is overlaid on the image, with the visible part above the water and the hidden part below.

BLUEPAGES
PROJECT/PRODUCT PAGES
BLOGS & WIKIS

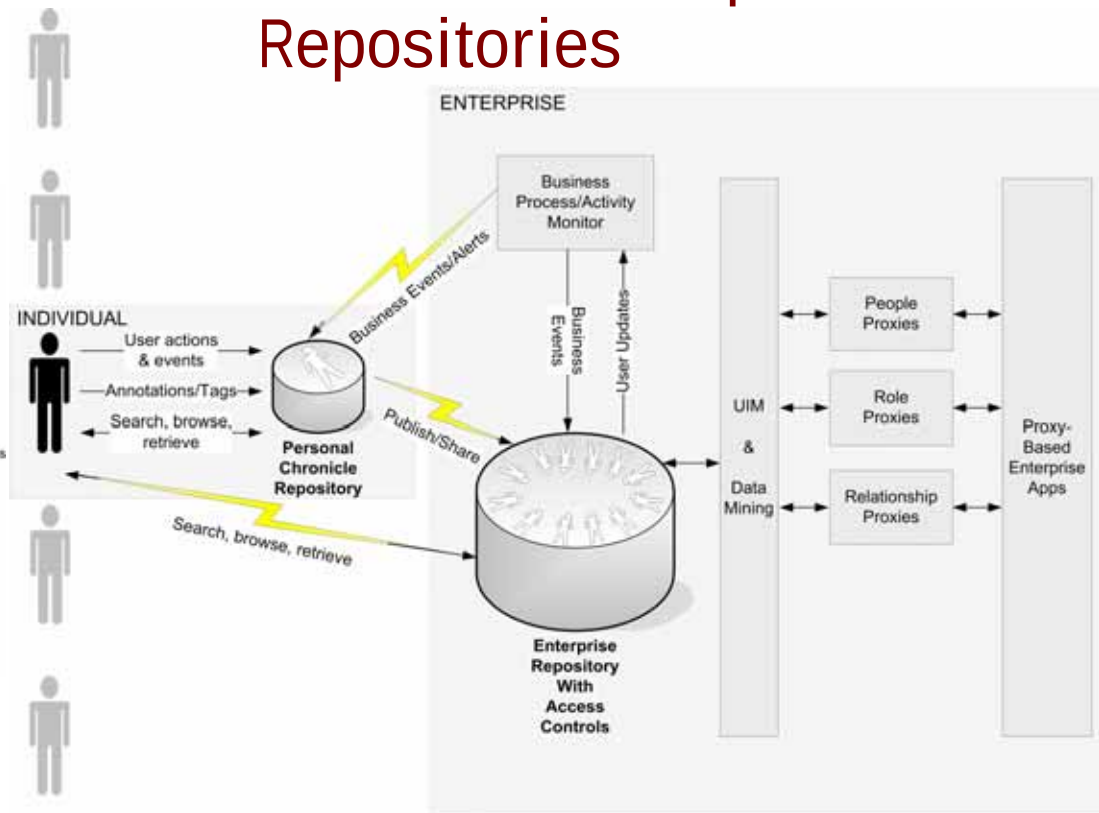
PRESENTATIONS SENT BY EMAIL
EMAIL
CHATS
WEB BROWSING
VOICEMAILS
CONFERENCE CALLS
MEETING MINUTES/TRANSCRIPTS
CONTACT HISTORIES
CUSTOMER LEADS
PROJECT STATUS
DEADLINES
PEOPLE WORKING ON TASKS
USER FILES & DOCUMENTS
PICTURES
VIDEOS
VOICE RECORDINGS

A Vision of Electronic Chronicles in the Enterprise

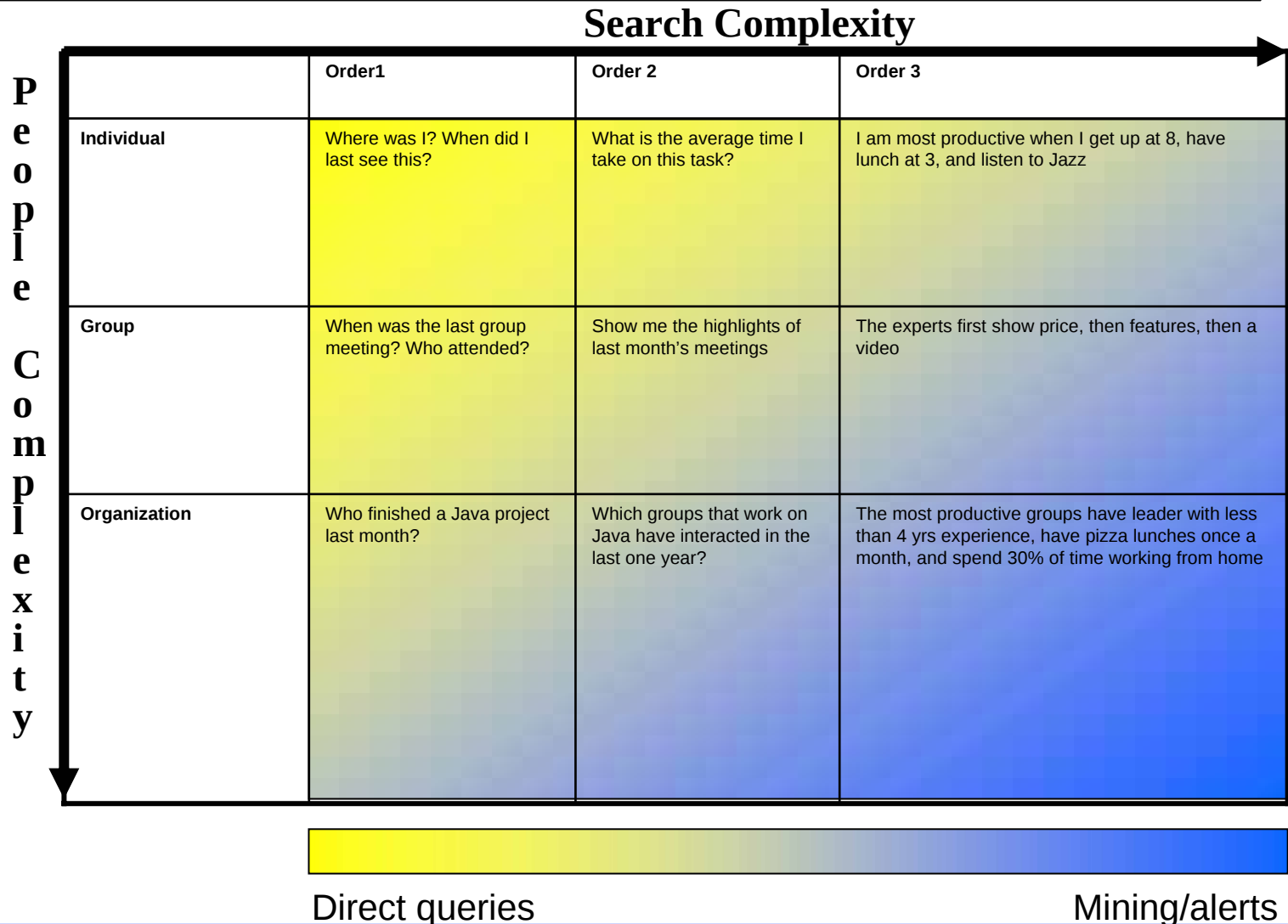
Personal Chronicling with variety of devices



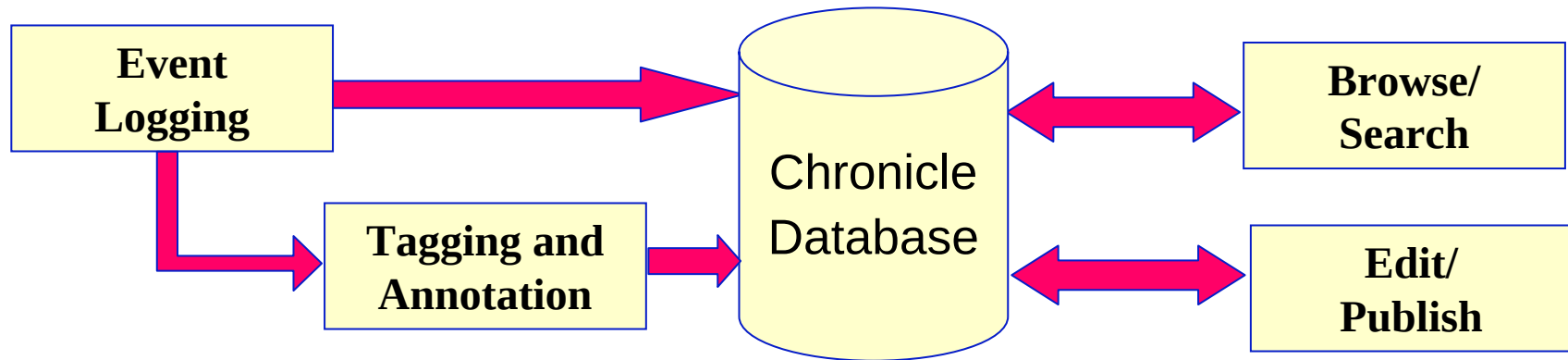
Creation of Enterprise Repositories



Query Types in Electronic Chronicles



Personal Chronicling Tools – A First Step

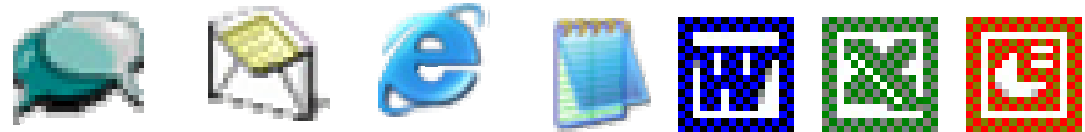


Enable employees to easily capture, organize, retrieve, and share ongoing activities, collaborations, interactions, and interests

- require very little effort and time
- provide sufficient benefits to motivate using them
- integrate with existing enterprise infrastructure
 - Lotus Workplace – calendar, email, meeting rooms..
 - Blog Central – easier to publish, richer, with better search tools

Logging with Personal Chronicling Tools

Logs most communication
between the user and their PC



Mail for Pilho Kim

New Memo Reply Reply to All Forward Delete Folder Copy Into New Tools Change Document

Search In View "PCTEventAll" Indexed

Search for Search

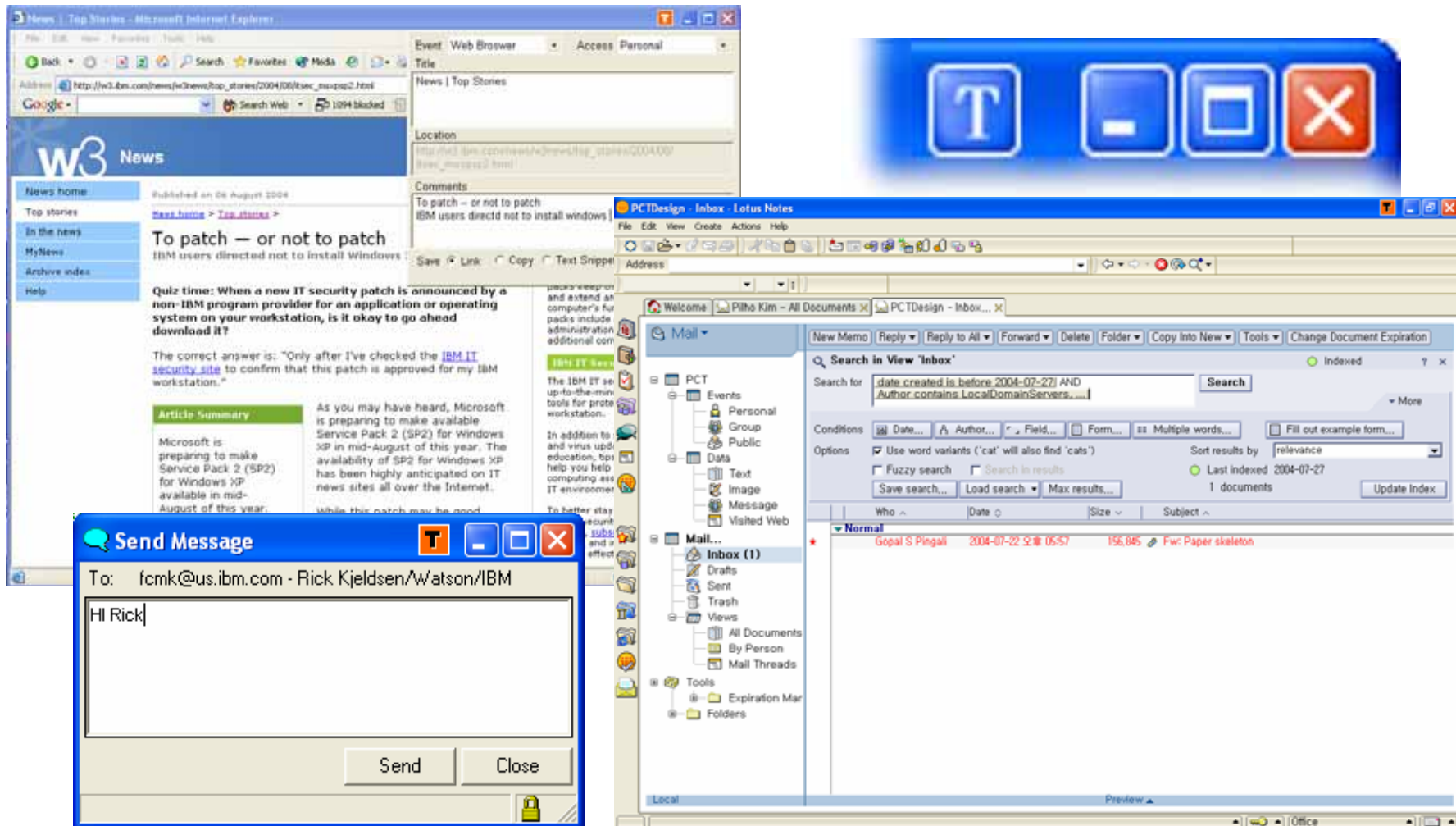
Event	Access	Channel	Direction	Who	Date
* PCT_Tag	Personal	PCT_Console	Incoming	Pilho Kim	2004-08-10
* PCT_Clipboard	Personal	PCT_Message	Incoming	Pilho Kim	2004-08-10
* PCT_Tag	Personal	PCT_Console	Incoming	Pilho Kim	2004-08-10
* PCT_Email	Personal	PCT_Console	Incoming		2004-08-10
* PCT_Email	Personal	PCT_Console	Incoming		2004-08-10
* PCT_Application	Personal	PCT_Console	Incoming	Pilho Kim	2004-08-10
* PCT_Application	Personal	PCT_Console	Incoming	Pilho Kim	2004-08-10
* PCT_Clipboard	Personal	PCT_Message	Incoming	Pilho Kim	2004-08-10
* PCT_Clipboard	Personal	PCT_Message	Incoming	Pilho Kim	2004-08-10
* PCT_Clipboard	Personal	PCT_Message	Incoming	Pilho Kim	2004-08-10
* PCT_Email	Personal	PCT_Console	Incoming		2004-08-09
* PCT_Email	Personal	PCT_Console	Incoming		2004-08-09

Left sidebar navigation:

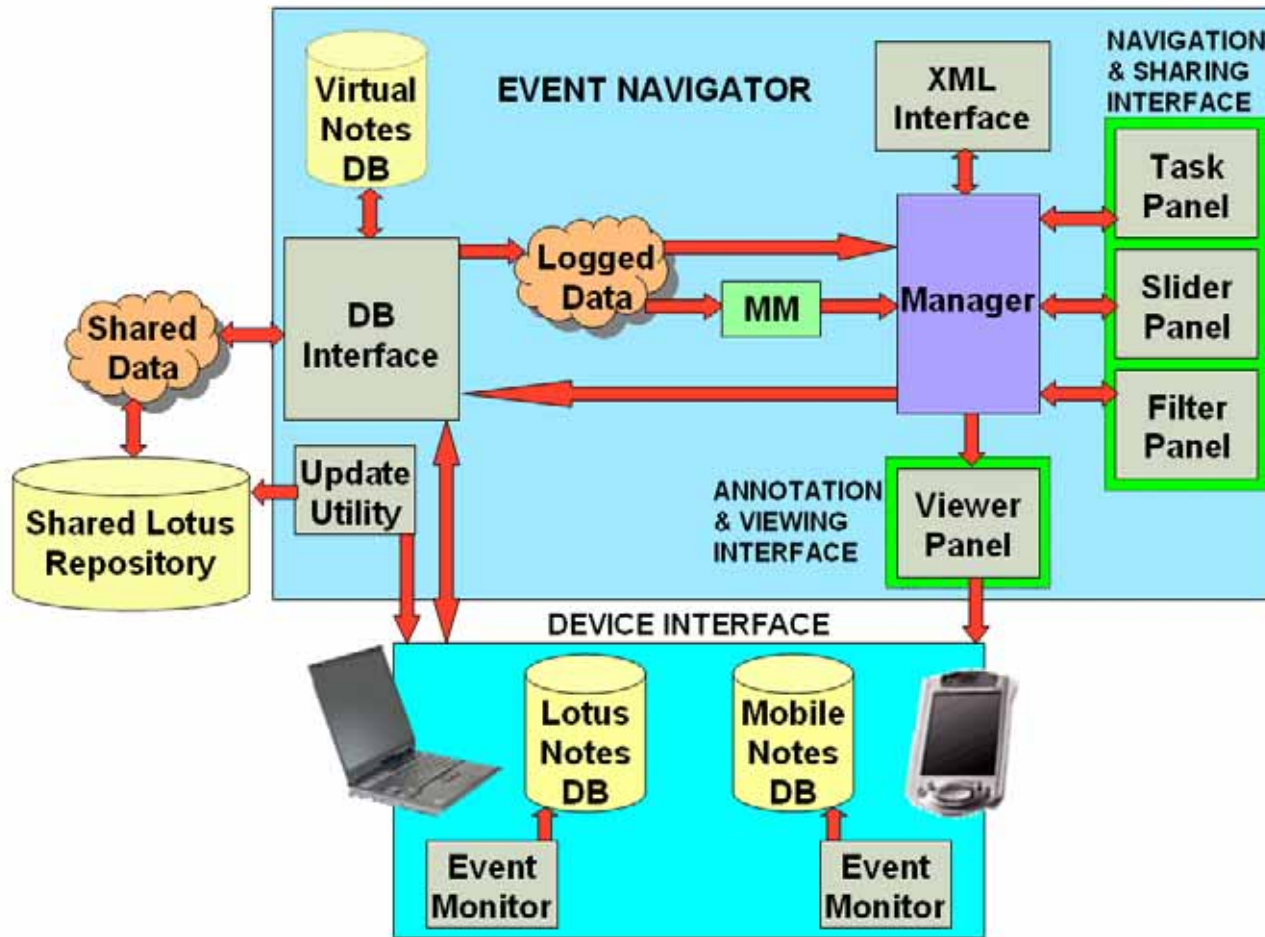
- PCT
 - Access
 - Personal
 - Group
 - My Group
 - My Department
 - Public
 - Untagged
 - Events
 - All
 - Clipboard
 - Documents
 - Tags
 - Web Sites
 - Email
 - Sometimes
 - Data
 - Text
 - Image
 - RichText

The Universal Tagging Button – Easy Book marking on the Desktop

Any opened Window has a new “T” button



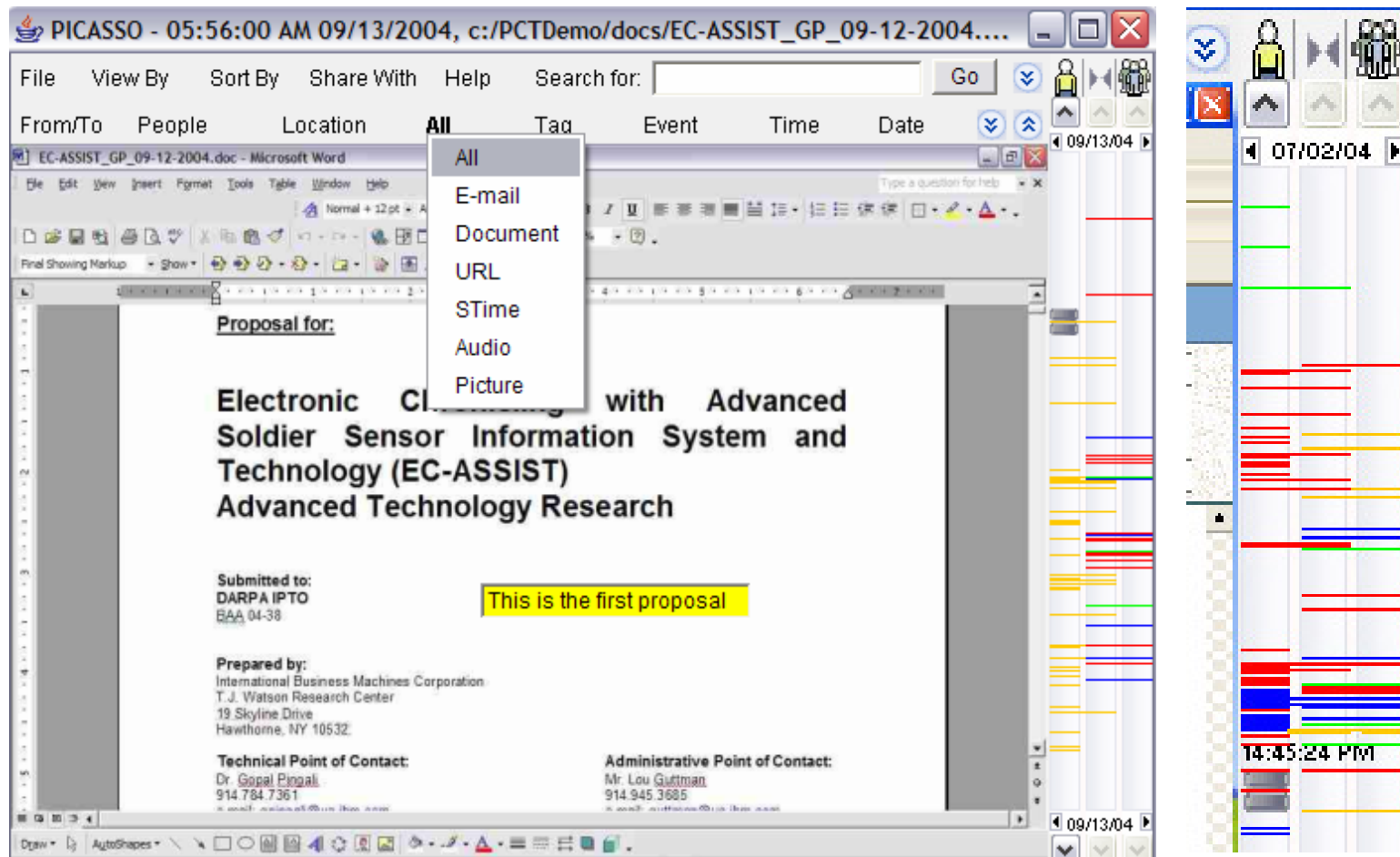
Navigation and Sharing of Electronics on PCs and PDAs



Initial Implementations:

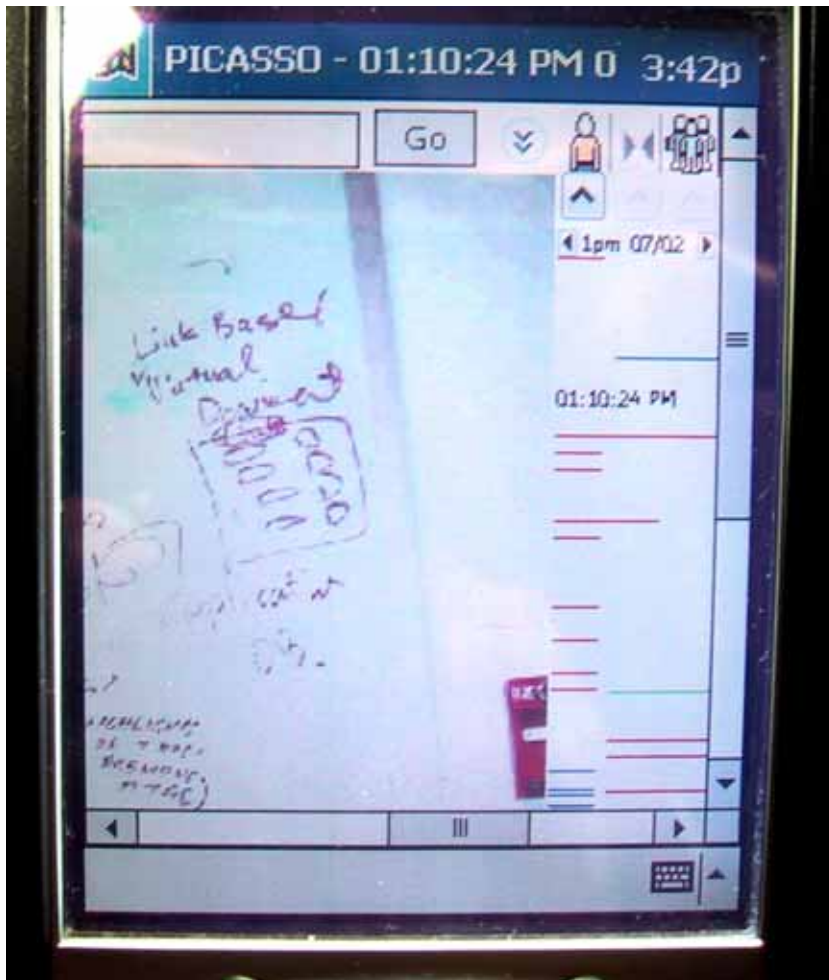
- Desktop Navigator
- PDA Navigator
- Enhanced Notes Calendar

Desktop Navigator



- Unified browsing of all personal and shared events
- Events shown as screenshots, with option to launch the original
- Search by when, what, who, where
- Integrated annotation and sharing

PDA Navigator



- Currently runs on PDA's with PocketPC OS
- Navigator design consistent across PC and PDA
- Uses Mobile Notes Database

Enhanced Calendar

Calendar Entry

Appointment

Subject

Meeting with JKL

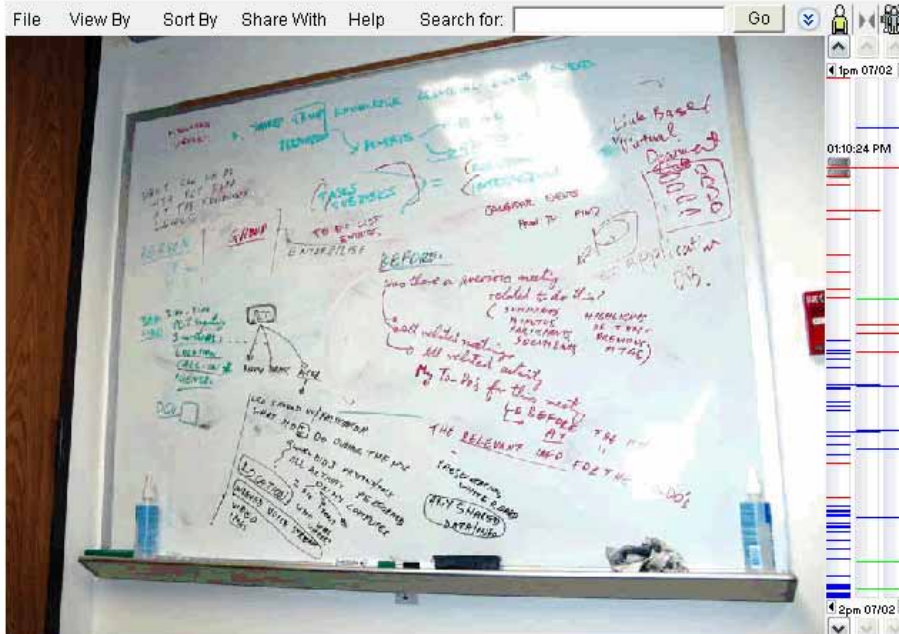
When

Starts Fri 07/02/2004 16 01:00 PM 1 hour

Ends Fri 07/02/2004 16 02:00 PM

☐ Specify a different time zone

Description

[Click to append attachment\(s\)](#)


- Java application embedded within Notes
- Automatically brings up all events in the time window seen in the calendar
- Enables easy navigation to past and future
- Supports full “who, what, where, when” search capabilities

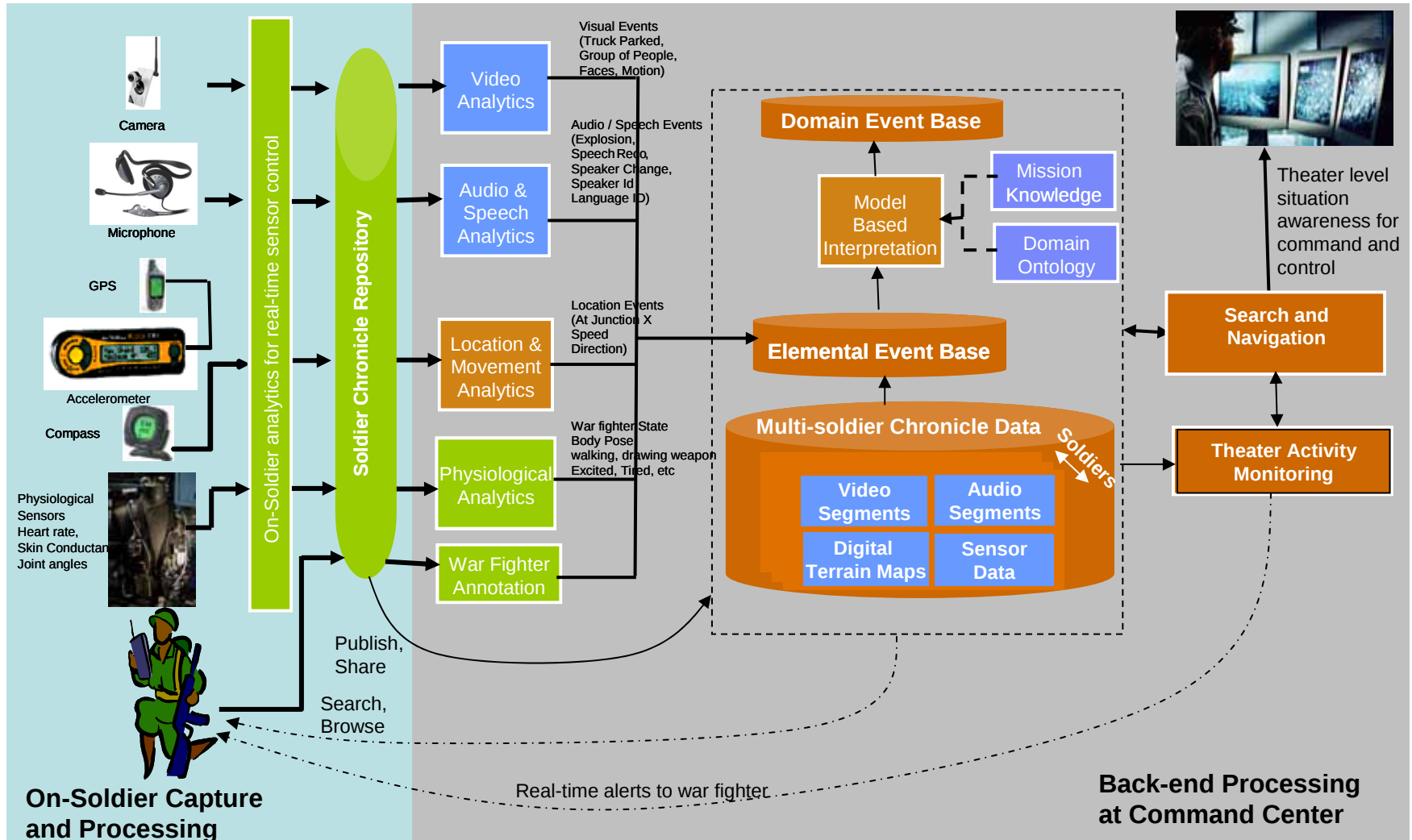


Chronicling in the Mobile Era

Electronic Chronicling for ASSIST

EC-ASSIST (IBM, Georgia Tech, MIT, AWARE Tech, UC Irvine)

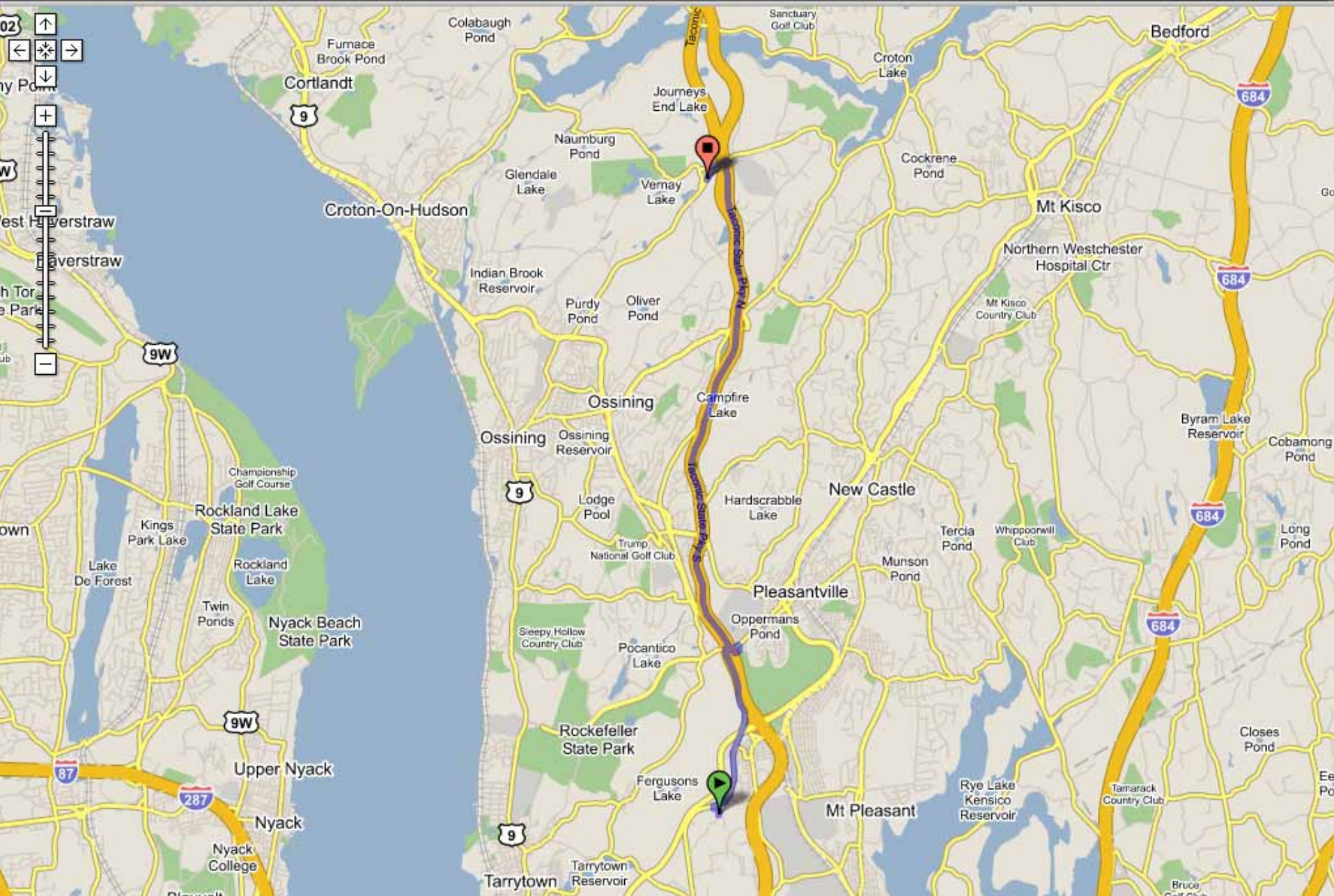
Develop an end-to-end electronic chronicling system for the ASSIST program that enables superior after-action reporting, and advanced search/notification capabilities that impact soldiers and commanders.



Convoy	All	and
Event	Children	and
Time	06:00-07:00	

SUBSCRIBE

Geospatial event subscriber



CONCLUSIONS

- **eChronicles: a big emerging challenge and opportunity**
- **Spans context capture, pervasive delivery, unified information management**
- **Ultimate measures are usability and real impact on people and businesses**
- **Privacy Concerns**
 - Need standards and clear boundaries to personal information
 - Perception of privacy is as big as the real issues of privacy protection
- **Potential Benefits to Businesses:**
 - Gains in business productivity
 - Polling and measurement of key business metrics
 - Better ways of finding expertise and skills
 - Unified information search and retrieval