

# Collaboration Tools & Lessons Learned

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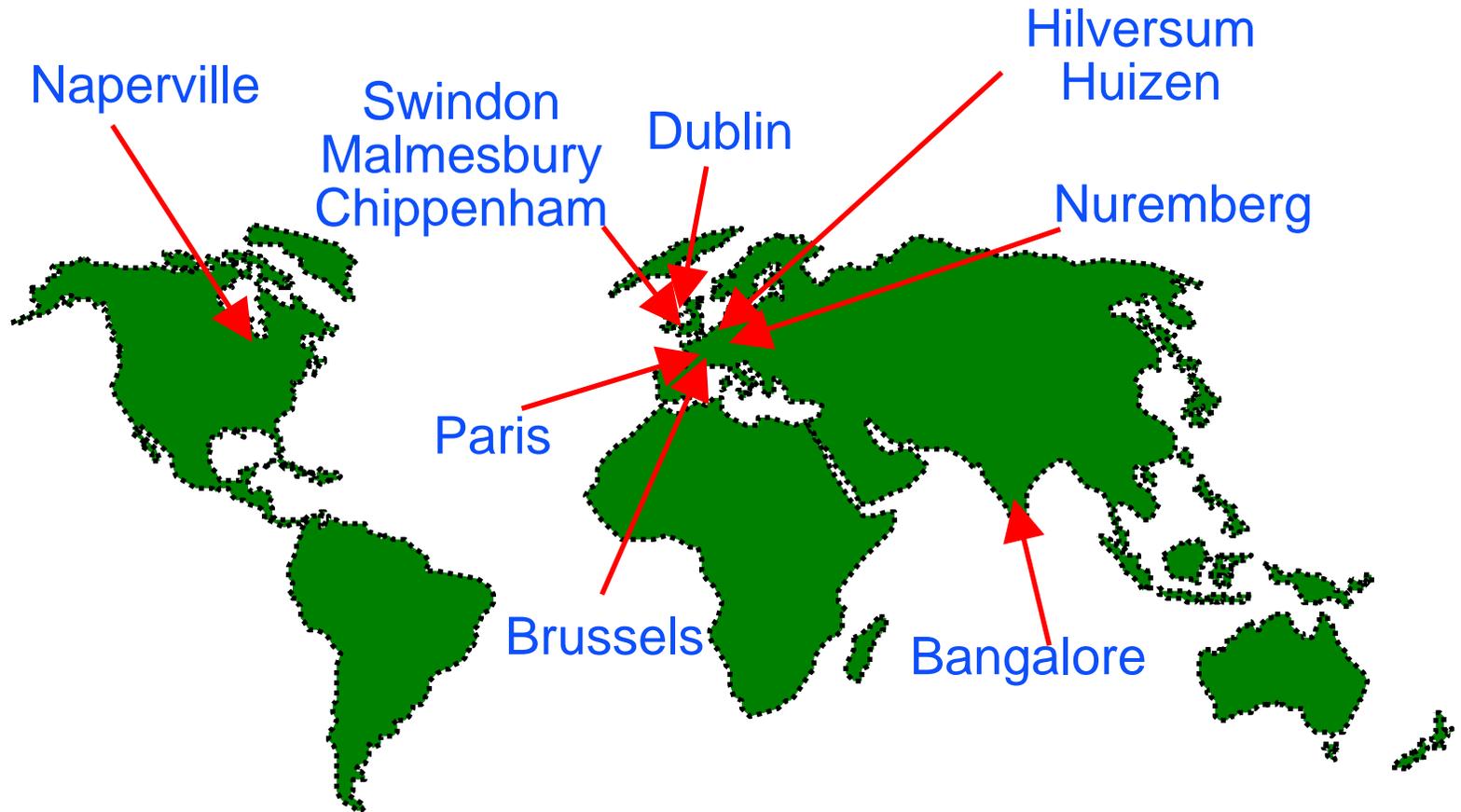
# Talk Overview

- Background - Research Project
- Tools Developed
- Lessons Learned

# Collaboratory Project

- Joint research project of Lucent Bell Labs and University of Michigan, 1998-2001
- Charter: investigate issues in geographically distributed product development
- Main project studied: Lucent GSM development

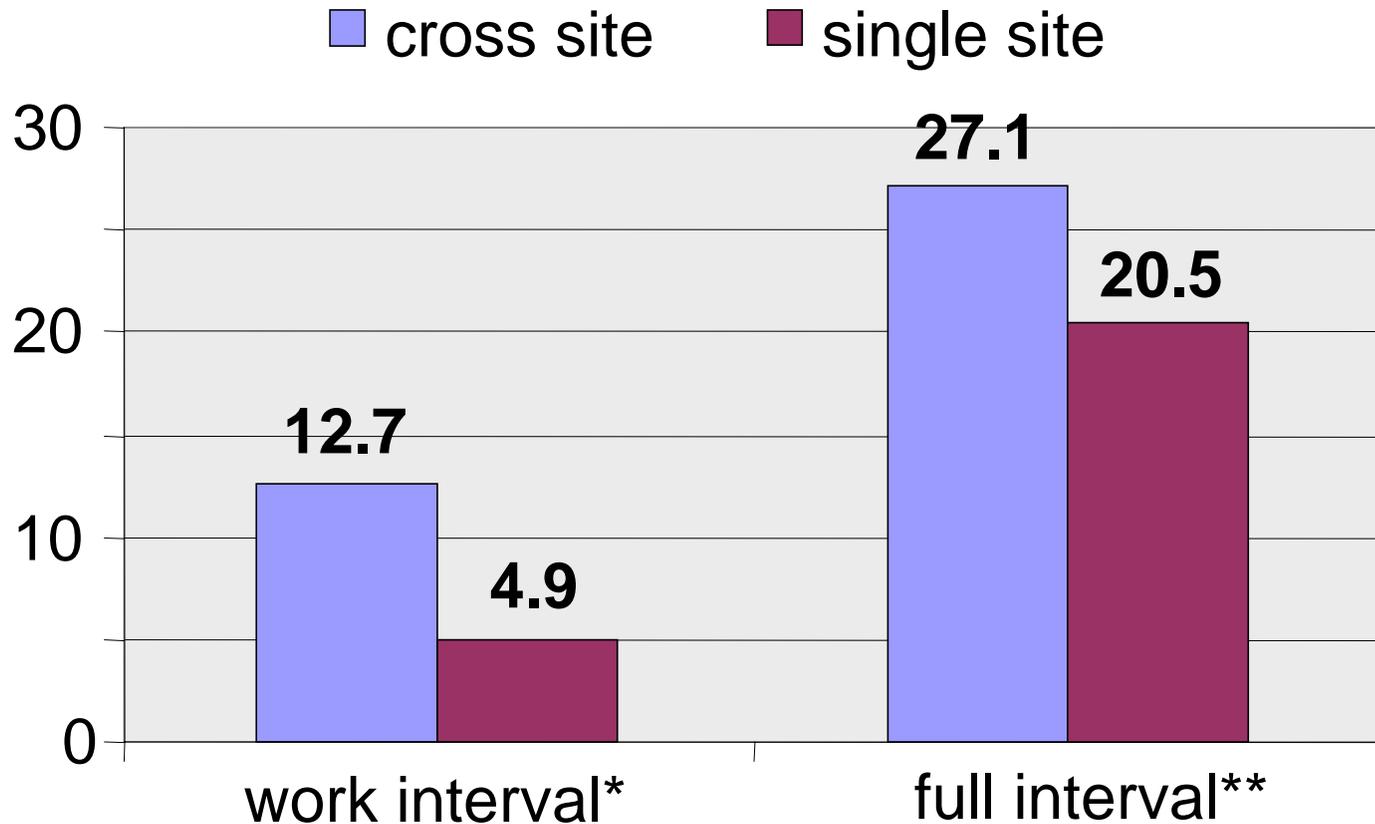
# Geographic Distribution



# Project Overview

- Interviews, surveys of developers, managers
- Analysis of software change activity
- Introduction of some commercial tools
- Development and deployment of collaboration tools

# Impact of distributed sites on development speed



\*Last Modification - First Modification

\*\*Last Modification - Open MR

# Collaboration Obstacles

- Lack of unplanned contact
- Knowing who to contact about what
- Difficulty of initiating contact
- Ability to communicate effectively
- Lack of trust, or willingness to communicate openly

# Effects on Development

- Issue resolution paralysis and delay
- More people required to do the same work
- Very difficult to stay “in the loop”
- Conflict or misalignment of team goals
- Nonexistent or impaired social networks
- Ineffective collaborative sessions
- Less help with heavy workloads

# Collaboratory Solutions

- Education - best practices
- Organizational
  - Align architecture and geographic distribution
  - Identify site liaisons
- Tools
  - Recommend commercial tools
  - Develop internal tools

# Tools

- Rear View Mirror
- CalendarBot
- ExV
- TeamPortal

# Rear View Mirror

- Presence Awareness
  - Who's around
  - Group oriented



# Rear View Mirror

- Group Chat
  - Always open
  - Persistent
  - Like a real time newsgroup



# CalendarBot

- Shared Calendar
- Modeled after In/Out board
- Web based
  - No application software required
- Self explanatory interface

# Calendar View

Dorene's CalendarBot - Netscape

File Edit View Go Communicator Help

**Dorene's CalendarBot**

[ [List view](#) | [Today's plans](#) | [Vacation plans](#) | [About](#) | [Group](#) or [User Administration](#) ]

Current group:

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*MESSAGE of the Day:* NOBODY CARES IF YOU CAN'T DANCE WELL. JUST GET UP AND DANCE.  
(Updated Wednesday, April 12)

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*Announcements:* CalendarBot internals have been changed. If you see any peculiar behavior, send mail to [David Atkins](#).  
(Updated Friday, March 24)

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Plans as of Thursday, April 13. Click on a date to view plans for that date. Click on a name to view plans for that person.

| <a href="#">Previous Month</a>   |  | <b>May, 2000</b>   |   |   |   | <a href="#">Next Month</a>                                      |  |
|--|--|--|---|---|---|---|--|
| Sun  | Mon  | Tue  | Wed   | Thu   | Fri   | Sat   |  |
|  | <u>1</u><br><a href="#">Atkins</a>   | <u>2</u><br><a href="#">Atkins</a>   | <u>3</u><br><a href="#">Atkins</a>  | <u>4</u>  | <u>5</u><br><a href="#">Handel</a>  | <u>6</u><br><a href="#">Atkins</a><br><a href="#">Handel</a>    |  |
| <u>7</u><br><a href="#">Atkins</a><br><a href="#">Handel</a><br><a href="#">Herbsleb</a> | <u>8</u><br><a href="#">Atkins</a><br><a href="#">Handel</a><br><a href="#">Herbsleb</a> | <u>9</u><br><a href="#">Atkins</a><br><a href="#">Handel</a><br><a href="#">Herbsleb</a> | <u>10</u><br><a href="#">Atkins</a><br><a href="#">Handel</a><br><a href="#">Herbsleb</a> | <u>11</u><br><a href="#">Atkins</a><br><a href="#">Handel</a><br><a href="#">Herbsleb</a> | <u>12</u><br><a href="#">Atkins</a><br><a href="#">Handel</a><br><a href="#">Herbsleb</a>                         | <u>13</u><br><a href="#">Handel</a><br><a href="#">Herbsleb</a> |  |
| <u>14</u><br><a href="#">Handel</a>  | <u>15</u><br><a href="#">Handel</a>  | <u>16</u><br><a href="#">Handel</a>  | <u>17</u><br><a href="#">Handel</a>   | <u>18</u><br><a href="#">Handel</a>   | <u>19</u><br><a href="#">Handel</a>   | <u>20</u><br><a href="#">Handel</a>                             |  |
| <u>21</u><br><a href="#">Handel</a>  | <u>22</u><br><a href="#">Handel</a>  | <u>23</u><br><a href="#">Coplien</a><br><a href="#">Handel</a>                           | <u>24</u><br><a href="#">Coplien</a><br><a href="#">Handel</a><br><a href="#">Mockus</a>  | <u>25</u><br><a href="#">Coplien</a><br><a href="#">Handel</a><br><a href="#">Mockus</a>  | <u>26</u><br><a href="#">Ardis</a><br><a href="#">Coplien</a><br><a href="#">Handel</a><br><a href="#">Mockus</a> | <u>27</u><br><a href="#">Handel</a>                             |  |
| <u>28</u><br><a href="#">Handel</a>  | <u>29</u>  | <u>30</u>  | <u>31</u>   |   |   |   |  |

Current Month:  2000

View another month:  2000

Document: Done

# List View

The screenshot shows a Netscape browser window titled "Dorene's CalendarBot - Netscape". The address bar shows a URL starting with "http://". The menu bar includes "File", "Edit", "View", "Go", "Communicator", and "Help". The main content area is titled "Dorene's CalendarBot" and contains several links: "[ Click on a name to modify plans | [Calendar](#) view | [Today's plans](#) | [Vacation plans](#) | [About](#) | [Group](#) or [User Administration](#) ]". Below the links is a "Current group:" dropdown menu set to "all".

There are three main sections of text:

- MESSAGE of the Day:** "NOBODY CARES IF YOU CAN'T DANCE WELL. JUST GET UP AND DANCE." (Updated Wednesday, April 12)
- Announcements:** "CalendarBot internals have been changed. If you see any peculiar behavior, send mail to [David Atkins](#)." (Updated Friday, March 24)
- Event Lists:**
  - Mark Ardis (email, post):**

|                 |                        |
|-----------------|------------------------|
| 12 Apr - 14 Apr | Software Symposium     |
| 26 May - 26 May | Vacation               |
| 5 Jun - 9 Jun   | ICSE, Limerick Ireland |
| 19 Jun - 23 Jun | ICRE, Schaumburg       |
| 14 Aug - 14 Aug | Last day at Bell Labs  |

Updated Monday, April 10
  - David Atkins (email, post):**

|                 |  |
|-----------------|--|
| 12 Apr - 14 Apr | Software Symposium, Naperville               |
| 1 May - 3 May   | IHP  |
| 6 May - 12 May  | Collaboratory tool installation - Nurensberg |

Updated Thursday, April 13

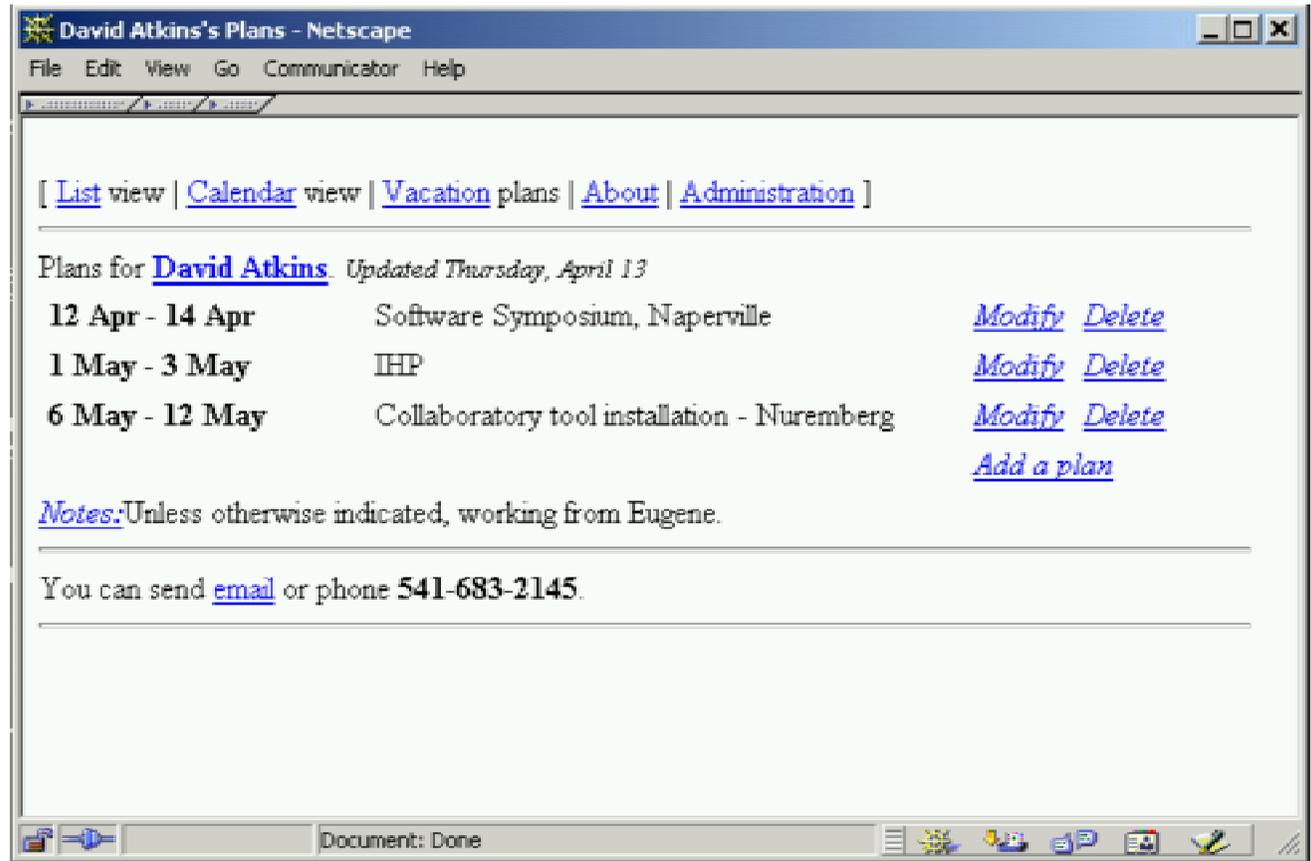
*Unless otherwise indicated, working from Eugene.*
  - Tom Ball (email, post):** *Now at Microsoft Research.*
  - Thomas Baran (email, post):**

|                |          |
|----------------|----------|
| 27 Mar - 5 Apr | Vacation |
|----------------|----------|

Updated Thursday, March 23

The browser's status bar at the bottom shows "Document: Done" and various system icons.

## Plan View with edit links



# CalendarBot Details

- Implemented in Mawl/C++
- Platform independent
- Proprietary data format
- Group views
- No logging in (but no security)

# Experience Browser

- Find code experts
- Uses change history data
- Web based

Who does what?

| MR raisers | Developers | Organizations |
|------------|------------|---------------|
| ntcmr      | rzaeh      | nsi5520000    |
| rhaines    | rhaines    | nsi6222       |
| hiackisc   | rpslin     | null          |
| rzaeh      | sararich   |               |
| liienert   | ivinouse   |               |
| sararich   |            |               |
| ivinouse   |            |               |
| bnossem    |            |               |
| ubuehl     |            |               |
| mengel     |            |               |
| frometsc   |            |               |
| hlocke     |            |               |
| rpons      |            |               |
| ernuldoon  |            |               |
| semnason   |            |               |
| bhessel    |            |               |

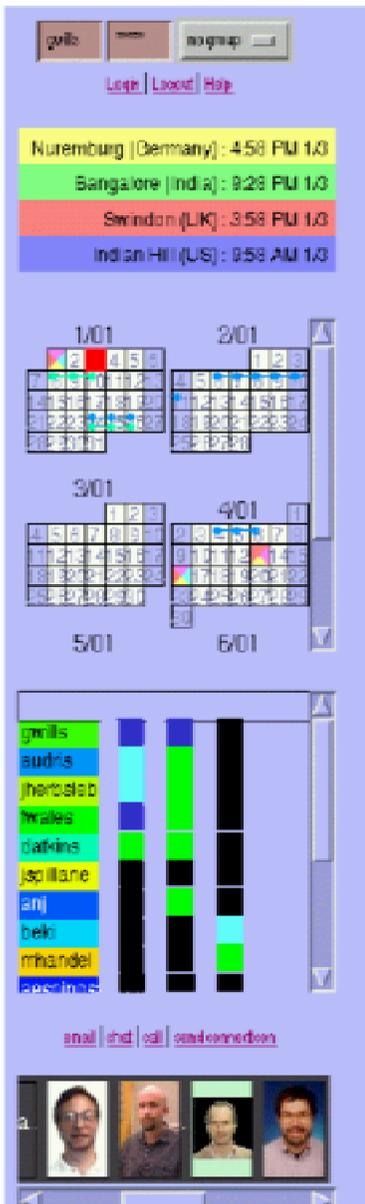
|                       |      |
|-----------------------|------|
| Number of Delta:      | 1048 |
| Number of Developers: | 8    |
| Numbr of MR raisers:  | 18   |

robert\_john\_haines

rhaines@mlgsa.uk.lucent.com

|                  |            |
|------------------|------------|
| Number of Delta: | 253        |
| Location:        | en         |
| Organization:    | nsi5520000 |

- nbg\_sw/ocnfe/src
- nbg\_sw/ocnfi/src
- pid
- pid/bcf
- pid/bcf/bcc
- swn\_sw
- comms
- srsh2/src
- ccp/src
- lmth
- tmnh/agent/bcf
- eabh
- simulators/cci
- srs/m/src
- tmnh



# Team Portal

- Convergence of communication
- Integrate presence, email, chat, schedules, etc.

# Open Channels

- Sustained collaboration
- More effective 'war room' alternative

The screenshot shows a Netscape browser window titled "GRAHAM HOMEPAGE CIVE TEST - Netscape". The address bar displays "http://www.spr.research.bell-hells.com/~gwillb/CIVE/pc/". The main content area is titled "OpenChannels" and is divided into several sections:

- Plans and Holidays:** A calendar grid showing dates from 1 to 31, with various colored squares indicating events or holidays.
- People:** A list of names and email addresses, including "Dennis, Dennis P [mailto:dennis@unat.com]", "Graham, James G [mailto:jg@unat.com]", "Gill, Samuel G [mailto:sg@unat.com]", "Hester, Robert G [mailto:rgh@unat.com]", "Hester, Mark [mailto:mh@unat.com]", and "Hester, James G [mailto:jgh@unat.com]".
- TradeNet:** A table listing names and locations with colored bars representing activity. The names and locations are: George Adams (New Jersey), Scott Butler (Palo Alto), Sam Cameron (London), Ron Davis (New Jersey), Lisa Edwards (Palo Alto), Tom Froy (Chicago), Jim Goo (Palo Alto), and Jim Hill (London). Below the table are buttons for "Participate", "Monitor", and "Replay".
- TradeNet -> estimation:** A table listing names and locations with colored bars representing activity. The names and locations are: Fran Johnson (Palo Alto), Jim Hill (London), Don Froy (Chicago), Ron Davis (New Jersey), and Sam Goo (Palo Alto). Below the table are buttons for "Participate", "Monitor", and "Replay".

# Lessons Learned

- Critical Mass
- Technology resistance
- Socializing is not work
- Privacy concerns

# Critical Mass

- It takes (at least) two to collaborate
- Perceived and real value accelerates with number of users
- Need plan for collective adoption to insure success

# Technology Resistance

- Intuitive interfaces essential to perceived value and adoption
- Resistance to installation, logistics of coordinated installation
- Need to keep training minimal
- Value must be enough to overcome adoption cost

# Socializing

- Collaboration facilitated by social relationships
- Trust necessary for effective communication and collaboration
- Social chat establishes collaboration basis, but doesn't seem like "real work"

# Privacy

- Privacy very important to many users
- Cultural differences in privacy needs
- Privacy fundamentally at odds with collaboration

# RVM Trials (& Tribulations)

- Difficult to get RVM usage started without enough users online
- Important to first convince users of value of presence monitoring and chat, not just training on tool usage
- A few enthusiastic users can jump start tool adoption

# RVM (continued)

- Organizational obstacles to installation
  - Need management mandate
  - Individual training needed in small groups
- Privacy features defeat effective use
  - No one could see anyone else's presence
  - Must ask colleagues for access permission

# CalendarBot Adoption

- Critical mass less of an issue
  - All names can be pre-loaded
  - As more plans appear, value increases
- Web interface means no installation
  - Including URL on organization pages quickly promotes use

# CalendarBot Simplicity

- Little or no training required
  - Interface self explanatory
  - Model obvious to grasp
  - Usefulness apparent
- No logging in required
- Easy to deploy improvements
  - Work of evolving data hidden from users

# CalendarBot Too Simple?

- Coarser grain than appointment apps
  - Double entry of data
- No security
  - Anyone can change any data
- No data compatibility with other tools

# Conclusions

- Presence awareness/messaging apps appealing to users, but hard to get started
- Simplicity in tools preferable for establishing use
- Value proposition must be compelling