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**Andy Moore** 

Publisher

**KMWorld Magazine** 







# Innovation @ Google: A Day in the Life



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# Innovation @ Google



# To organize the world's information and make it universally accessible and useful.



# **Google Overview**



Current Index:	World's largest search engine
Employees:	16,000+ many of whom are technical / engineering
Search Market Share:	More than 62% of worldwide search page views <sup>1</sup>
Enterprise Customers:	More than 15,000 customers to date
Office Locations:	More than 40 offices worldwide including Mountain View, New York, Boston, London, Tokyo, Hamburg, Paris, and Milan
International:	109 interface languages and 113 international domains











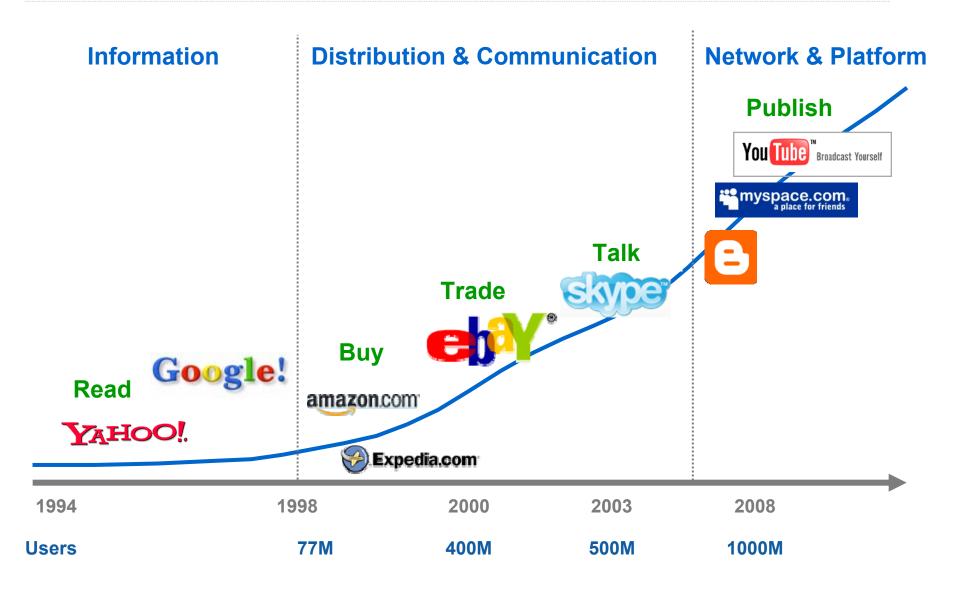






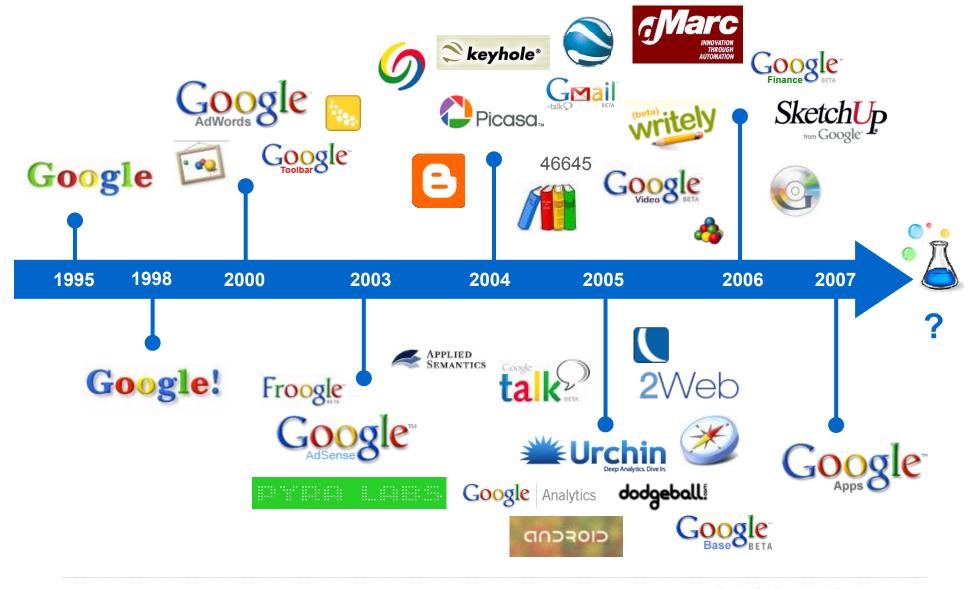
#### **Internet Evolution**





#### Google Has Evolved with the Internet



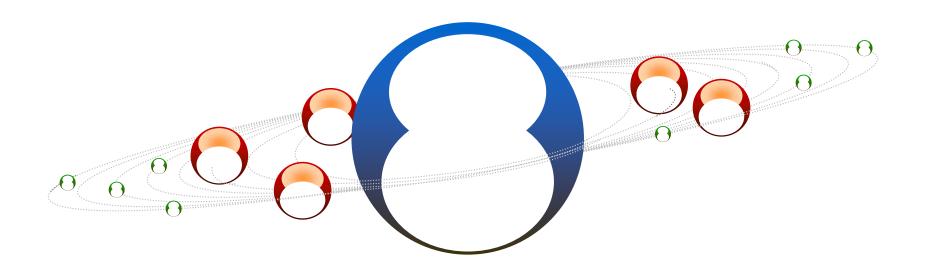




# Fostering Innovation @ Google

# Sergey's Resource Allocation Rule







#### Search, Ads, Apps

Search Quality Crawl/Indexing AdWords / AdSense Google Apps



#### **Strong potential**

Blogger Picasa News Pack



#### Wild and Crazy

Offline Ads Google WiFi Google Transit

### **International Collegiate Programming Competitions**





# **Google's Engineering Centers**

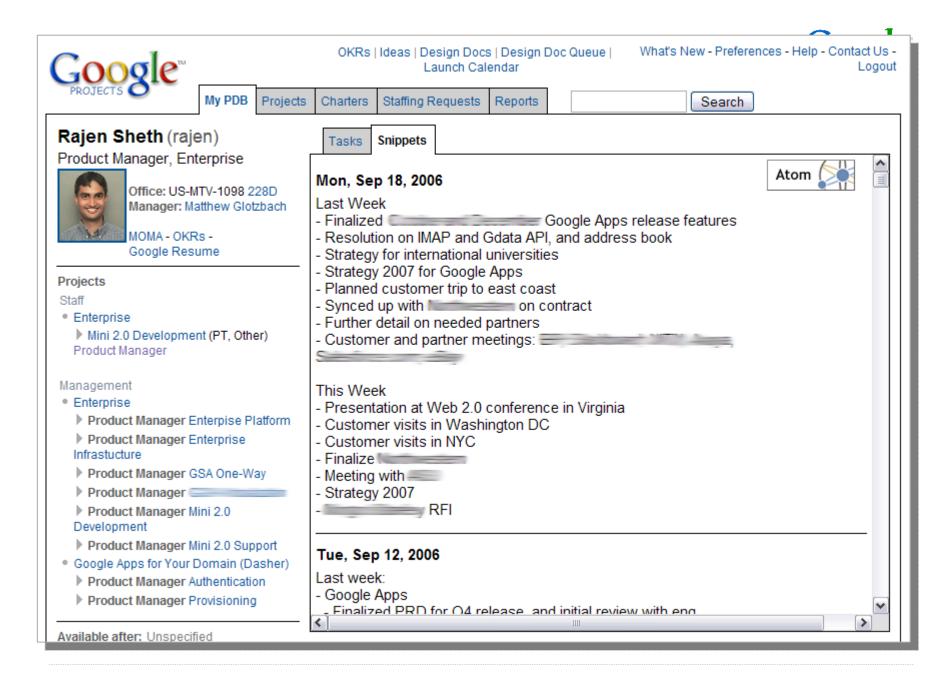




# Flatten management structure

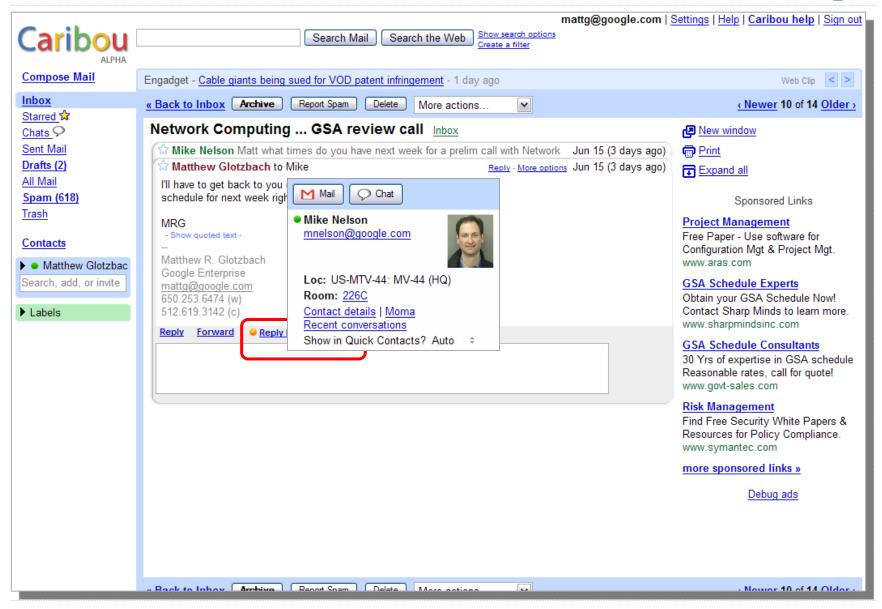


Snippet Reminder Inbox	e Print
☆ PDB Snippets to me	show details 7:27 am (31 minutes ago) 🦘 Reply 🔻
Greetings mattg,	
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If you would like to temporarily or permanently stop your MyPDB page and clicking the Snippet Sign-up <a href="http://p.corp.google.com/PersonHandler?action=ViewPlease">http://p.corp.google.com/PersonHandler?action=ViewPlease</a> use good judgement in opting into or out of s	ewSnippetGroups
For more information about snippets in general, plea http://www.corp.google.com/help/pdb/?q=snippets	se read the Snippets section of the PDB manual:
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[Please direct all questions to pdb-support@google.snippet.]	com. Responding to this email will attempt to submit a
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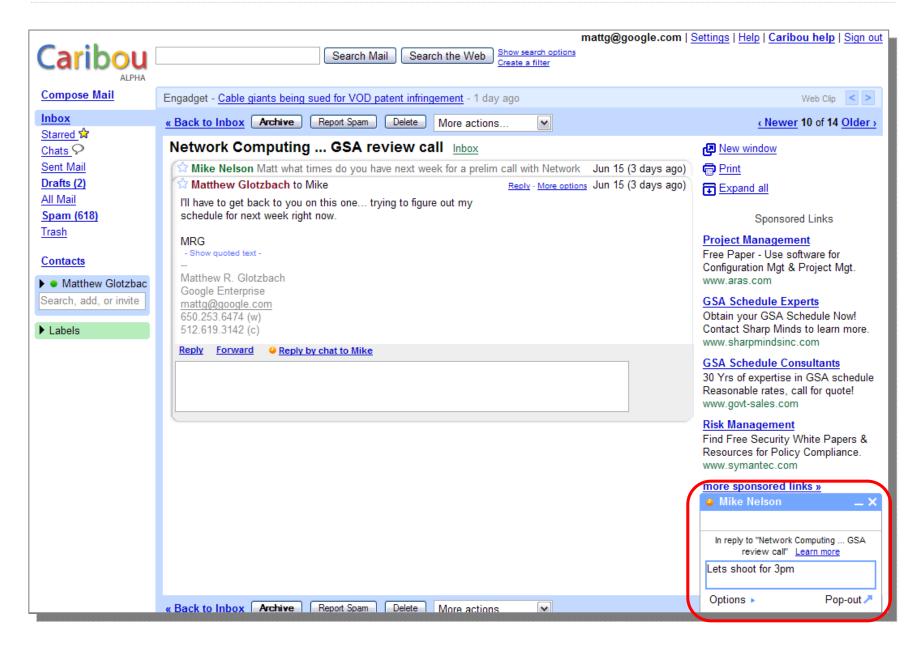
#### Iterative design, constant improvement





### Try new ways of doing things





#### Generate, prize & encourage people to act on new ideas







Welcome, Matthew Glotzbach Preferences SSO Logout

Refresh

#### O fu@google.com - google talk IM babel fish

Sep. 25, 2006 3:42am

A developer in Pakistan has come up with clients for MSN Messenger and Google Talk that bidirectionally translate text as it goes back and forth in a chat:

http://www.madeinexpress.com/finalist10.asp?id=10 (link to screenshots at bottom of that page)

So for example, let's say I have a friend in China that's not very good at English. I type my messages in English, and they come out on my friend's end in Chinese. Conversely, s/he types in Chinese, and it comes out on my end in English.

If this could be done well, it would be awesome. Abbreviations and slang would pose an issue (rotfl, lol, etc.) but it's still a neat concept.

-john

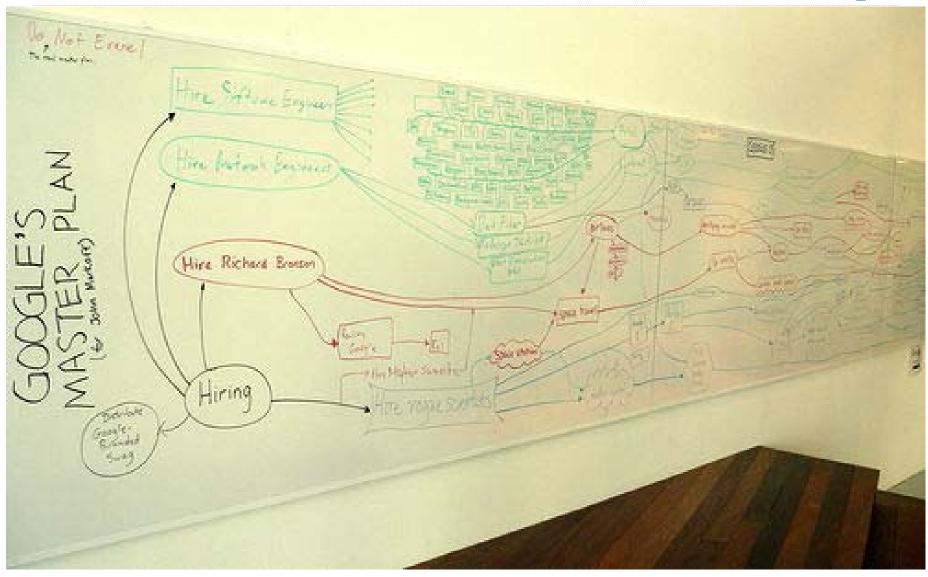
#### 

Dimitri Fischler Sep. 25, 2006 4:26am

The big problem I see is the sender's uncertainty of what's actually being read by the addressee. But this is clearly a massive opportunity for inter-lingual communication. Definitely has potential!

# Innovation Is a Collaborative Process







## My first week's task

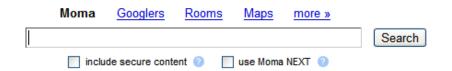


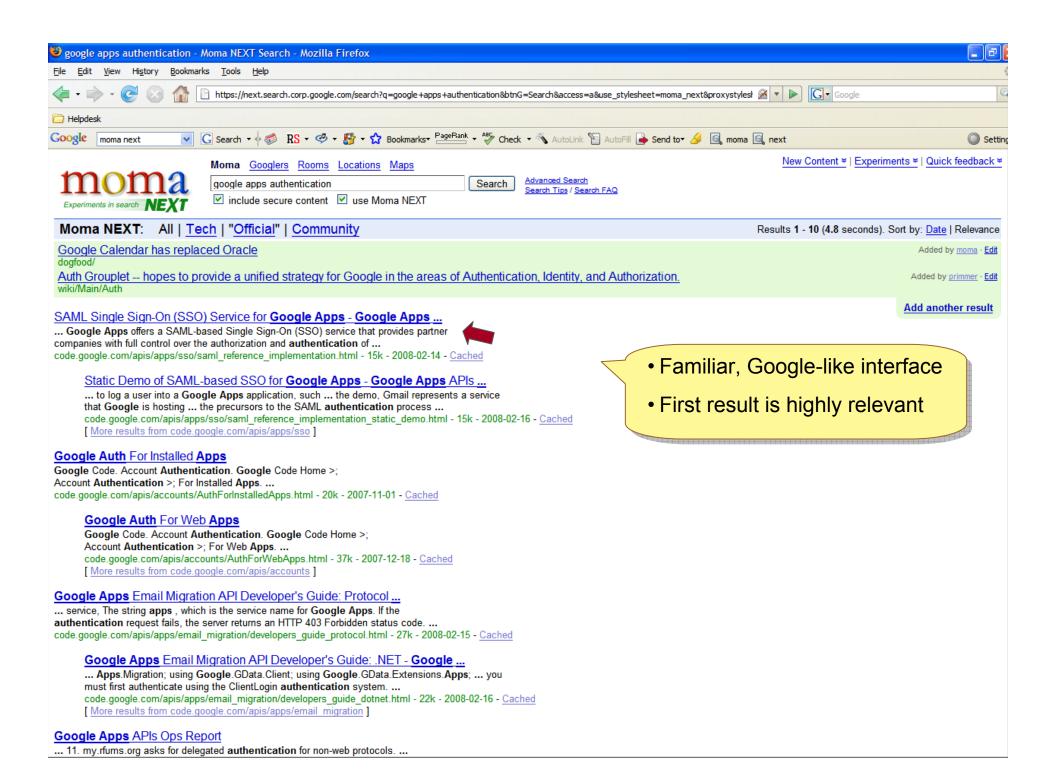
#### **Task**

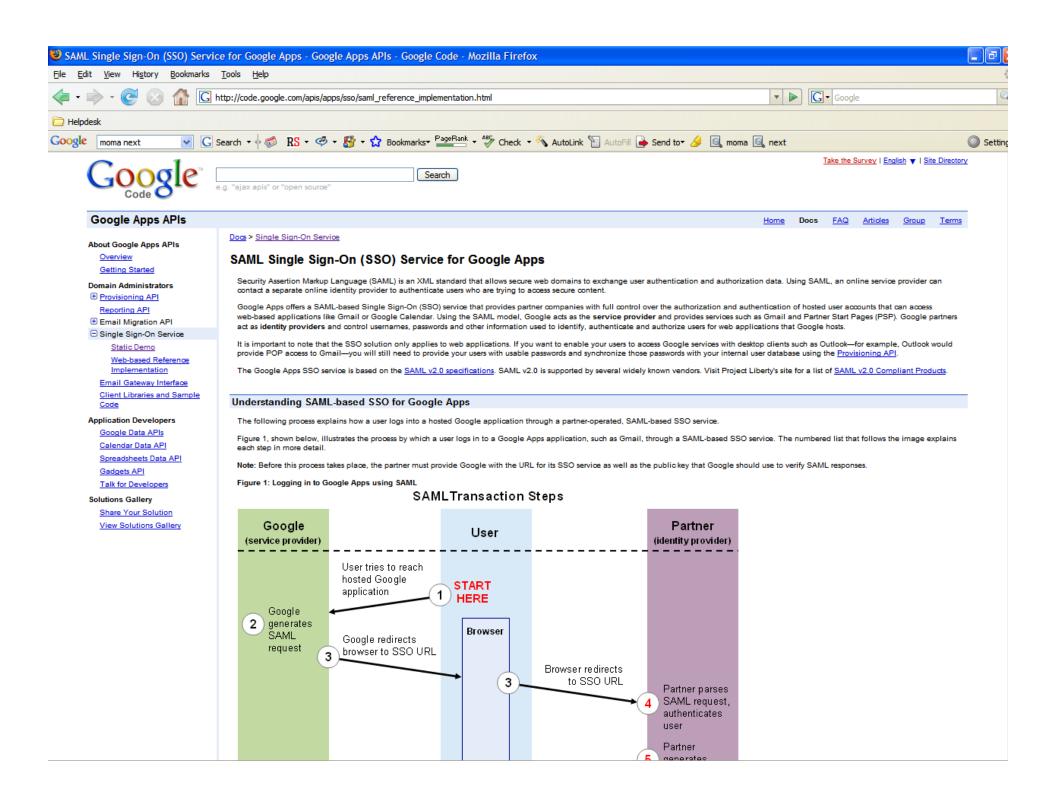
- Just hired into Google Engineering
- Top-secret Killer App
   Product for Google Apps
- Design the Authentication Services / Interfaces
- Enable partners and customers to integrate into their environments

#### **Tool**



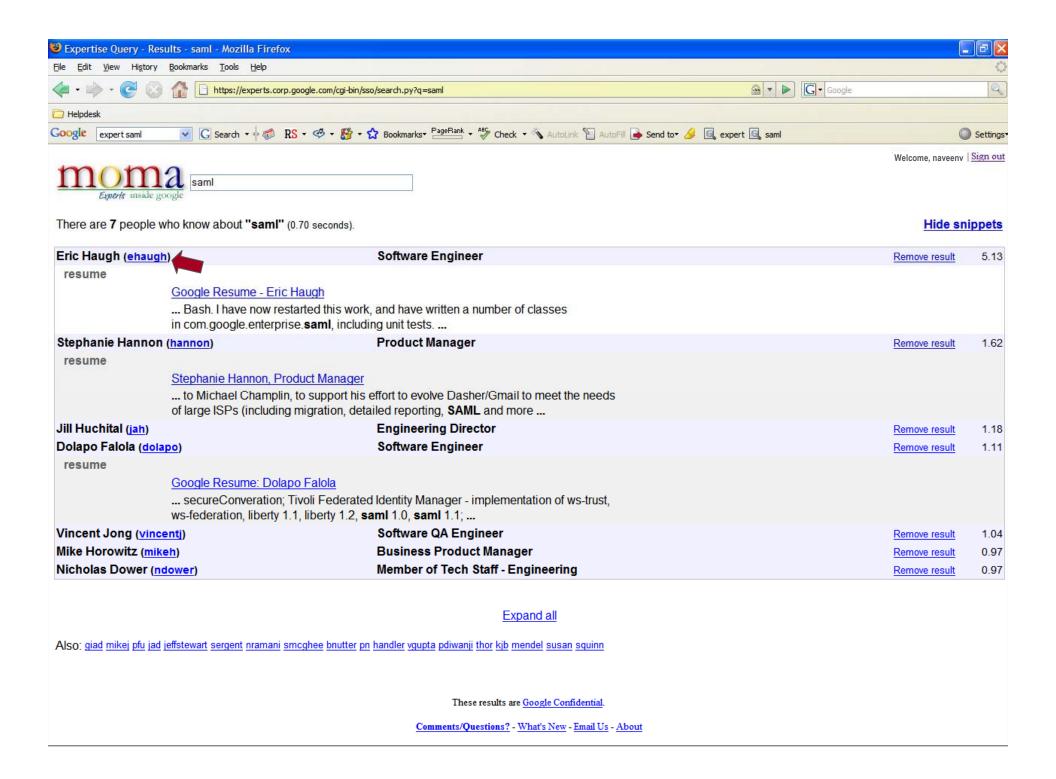


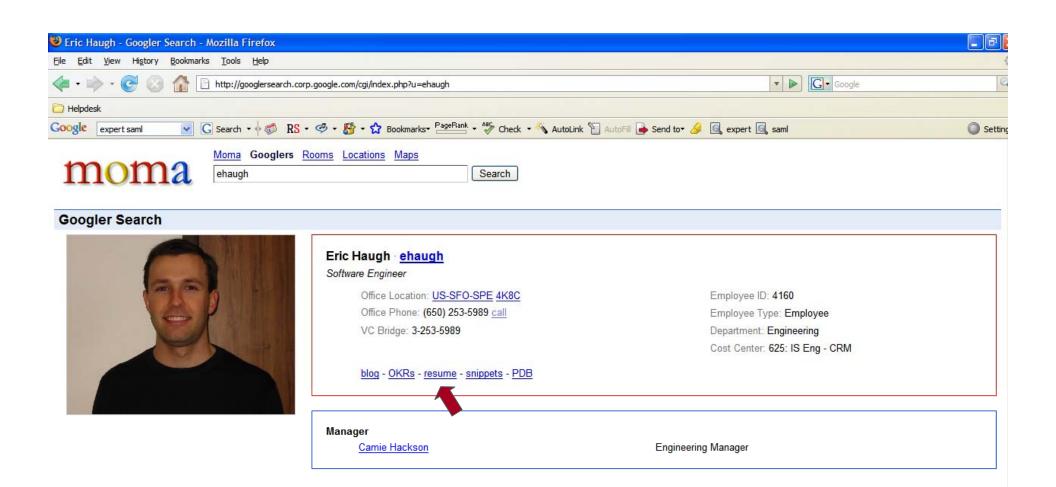












Tip: Visit who/ehaugh/resume to quickly reach ehaugh's resume. Learn more

Change Googler info: use GoogleHR (or file a ticket if GHR is not available) - Change location - Change photo - Send feedback on Googler search

Note: Changes to information may take a day to appear on Googler search; please be patient.

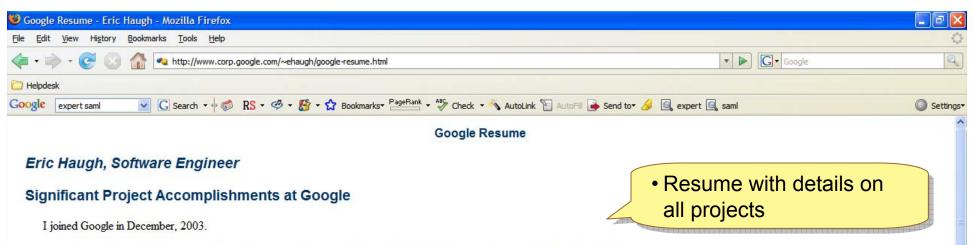
Organizational information

Total time: 0.0730 secs

Please note: Google's internal Web site contains confidential information that should be accessed on a "need to know" basis. If you have questions about what this means, please contact the Google lawyer who handles confidentiality.

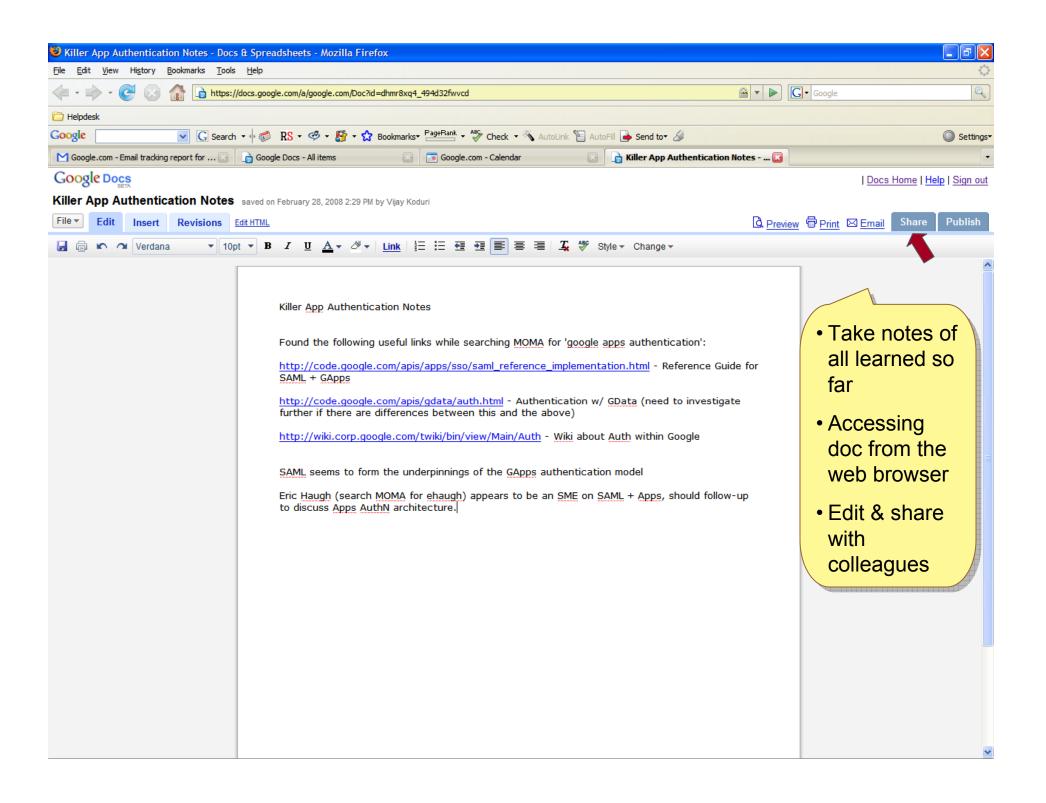


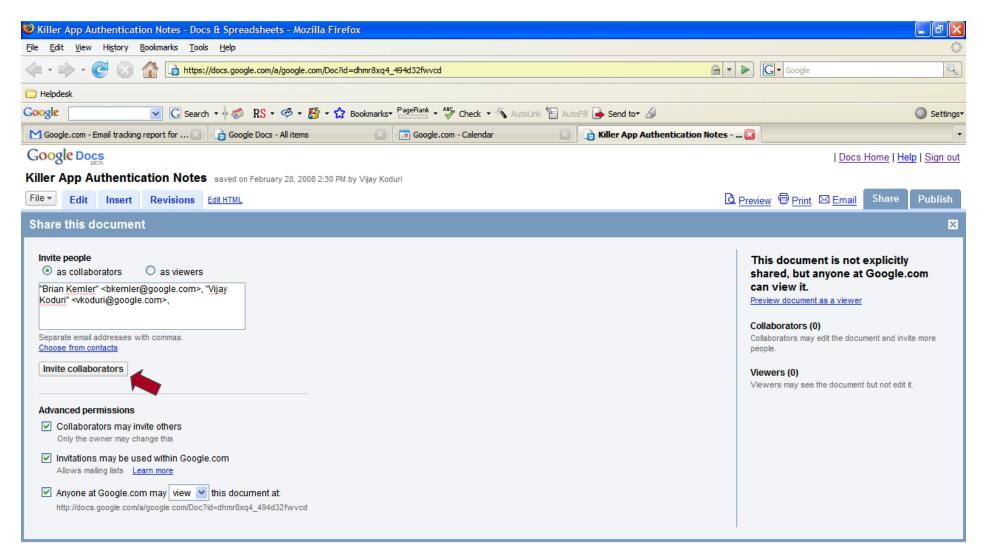




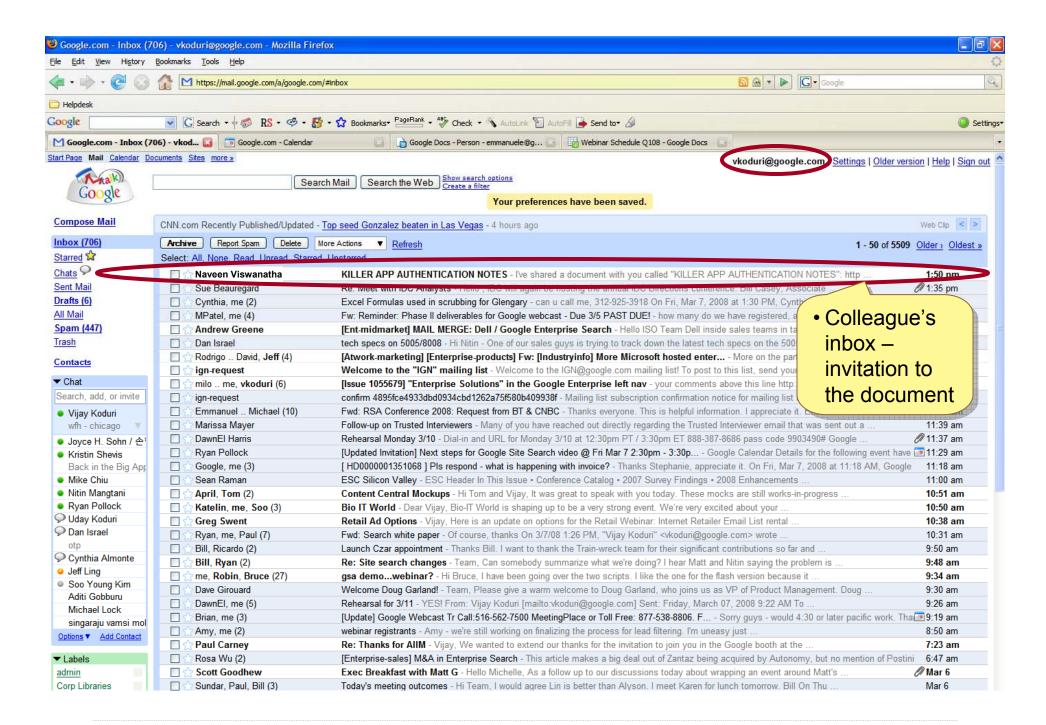
- . Gwsee August 2007 current. I'm writing a new Java server that, combined with Enterprise Superroot, will replace GWS.
- Enterprise TQ2 and 5.0 April 2007 August 2007. The Entprise "Move to Head" effort morphed into the "TQ2" effort, where the goal was to make our code shippable by the beginning of July, a target that we hit. I did a number of things for this effort. I removed our dependence on third\_party/java/html\_parser. I made various changes in enterprise\_gws\_branch to remove lingering third party dependencies. I contributed to the HIP clean-up of enterprise\_gws\_branch. I fixed various bugs deemed too critical to ship with. I modified gws to talk to AuthzChecker instead of headrequestor.
- Enterprise GWS January 2007 Present. As a stop-gap measure, I created enterprise\_gws\_branch from which we build gws, and I release the binaries which get pulled into our other builds. I've since been the maintainer of this branch, doing down-integrates and releasing new binaries as appropriate.
- Move to Head November 2006 March 2007. I up-integrated various changes that affected authzchecker and EnterpriseFrontend to main branch, including ones made to Google-wide packages. This also included changes made by our summer interns, George and Cavlin. I took on the task of up-integrated all GWS changes, which has morphed into evaluating the options for solving the problem of the fact that GWS in main branch will soon not contain functionality that we rely on. I'm currently writing a design document for writing a GWS replacement that should be a significant data point used to make this decision.
- Cleaning Up EnterpriseFrontend September 2006 and onwards. I made it my 20% project for a while to clean up EnterpriseFrontend and make it something that resembles a respectable piece of software. So far I've made the bulk of the code conform to the Java style guide, I moved the classes in com.google.net.httpsession that it depends on to com.google.enterprise.httpsession, I've removed some of the dependence on AlarmThread, and removed a number of files containing dead code. Others have since contributed significant clean-ups as well.
- GSA 3.4.14 Maintenance June 2005 current. With kens and rayc, produced a patch for our Mini product to remedy a number of security vulnerabilities that were brought to our attention by a third party. This is a very old version of the software, and there are no longer any Enterprise engineers who worked on it, initially, we couldn't even build it. I made changes to support running a newer version of the Stellent libraries so they could be run in a sandbox, since they contain many vulnerabilities. I fixed a cross-site scripting vulnerability on the 'client' and 'site' URL parameters. I fixed another cross-site scripting vulnerability related to UTF-7.
- GSA 4.6.4 June 2006 December 2006. Designed the authentication and authorization aspects of the Connector Manager Framework. Implemented the GSA-side aspects of them. Fixed a number of bugs.
- com.google.security.saml March 2006 June 2006. I've been a consultant on the SAML support for Dasher project, and have shared what SAML knowledge I have with that team. I moved the enterprise SAML code from com.google.enterprise.saml to com.google.security.saml, so it can be shared with Dasher. I've done code reviews for Mike Jones, who has been adding code to this library. I'm still a consultant on this project, but I can't say I've really done much since about June.
- GSA 4.6 February 2005 June 2006. Wrote the design doc for the Authentication GPI and began implementing it, before that work was interrupted by the Bug Bash. This work was resumed

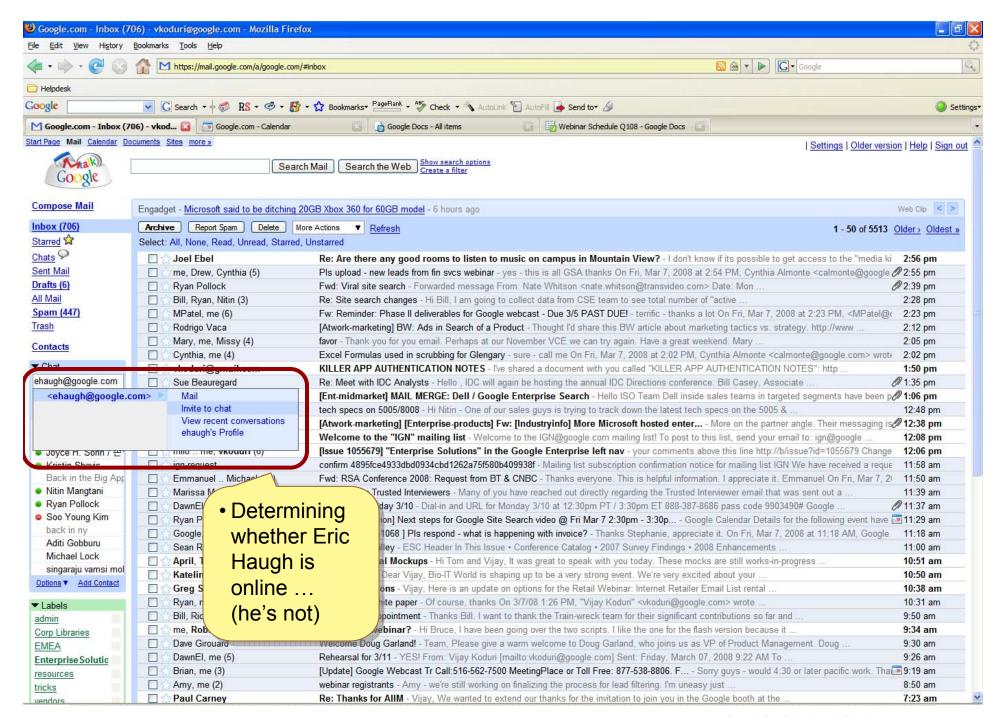


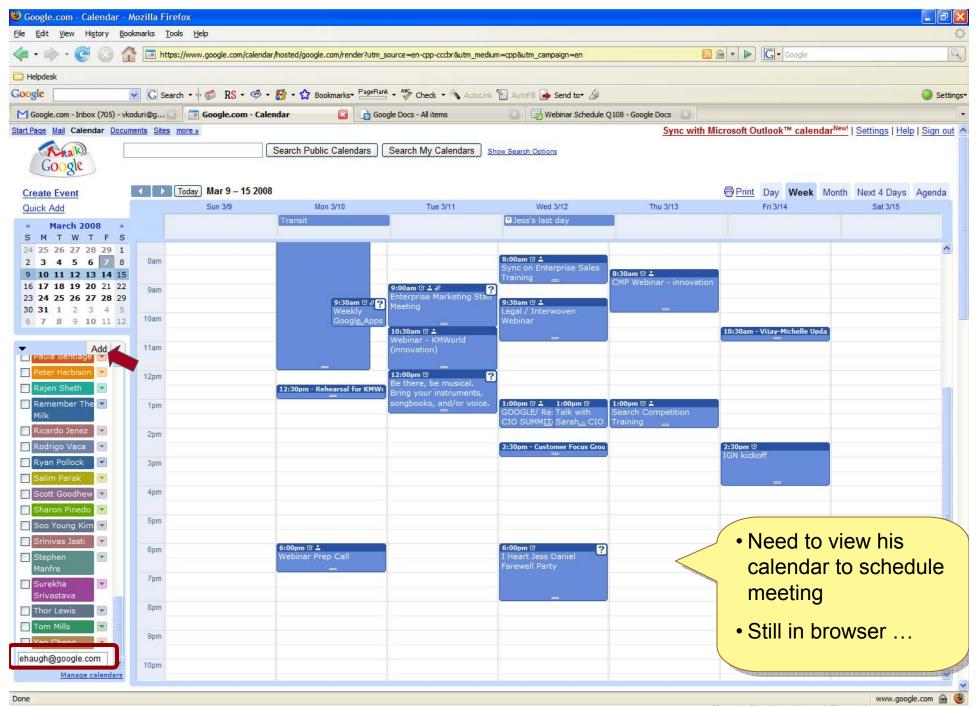


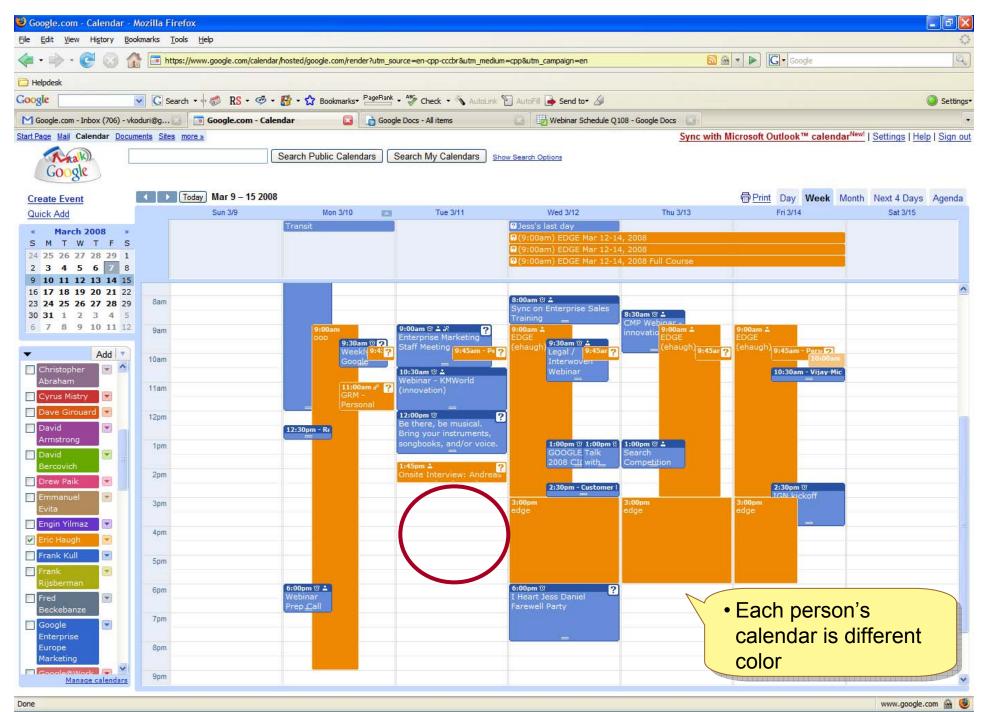


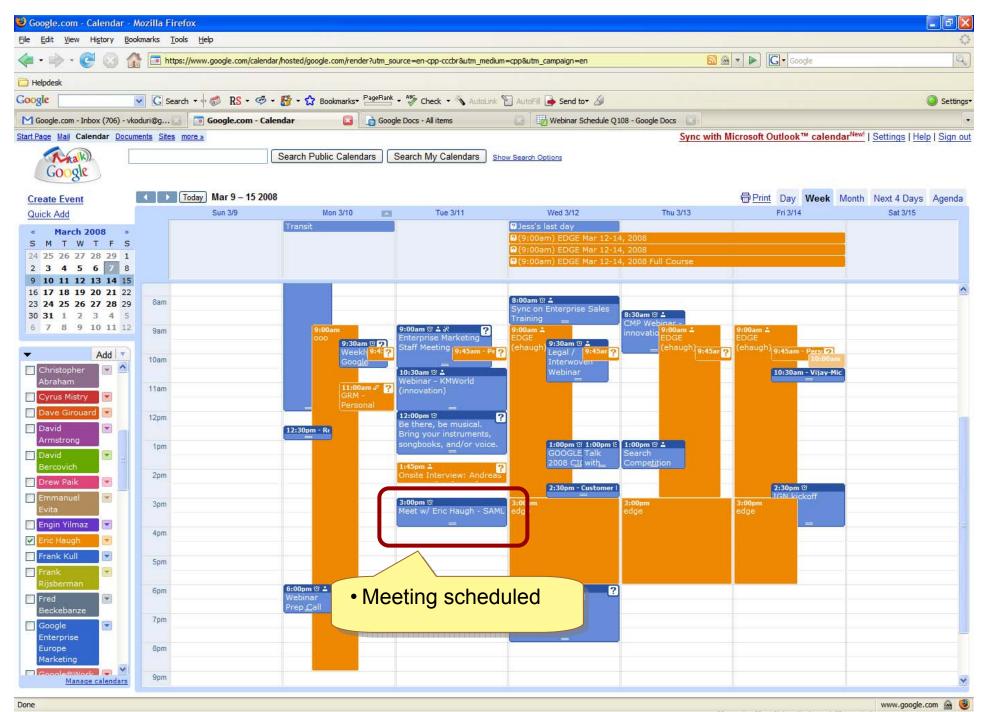
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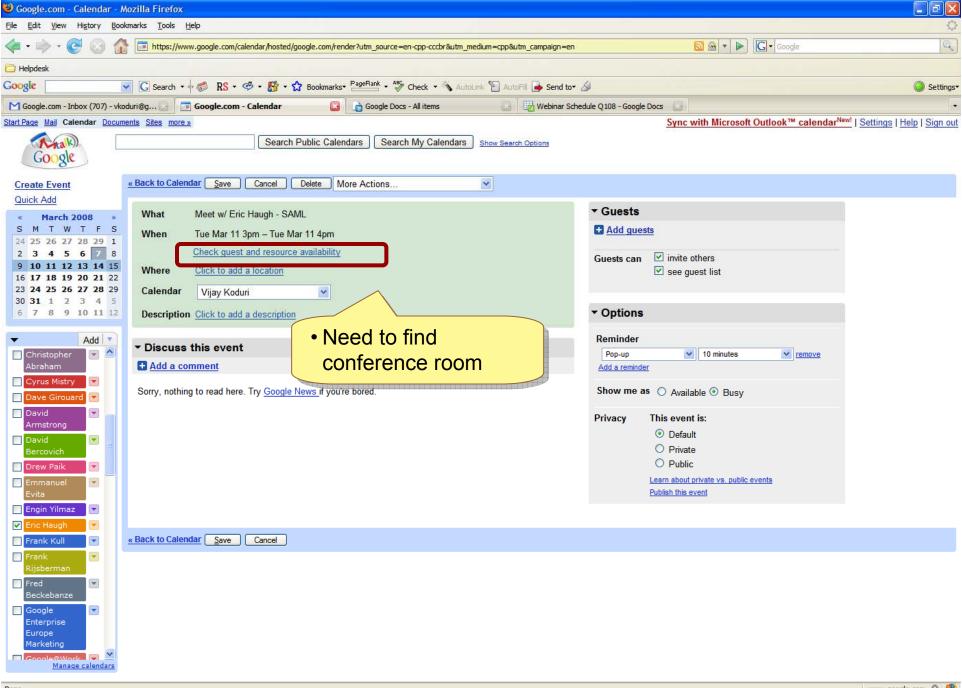


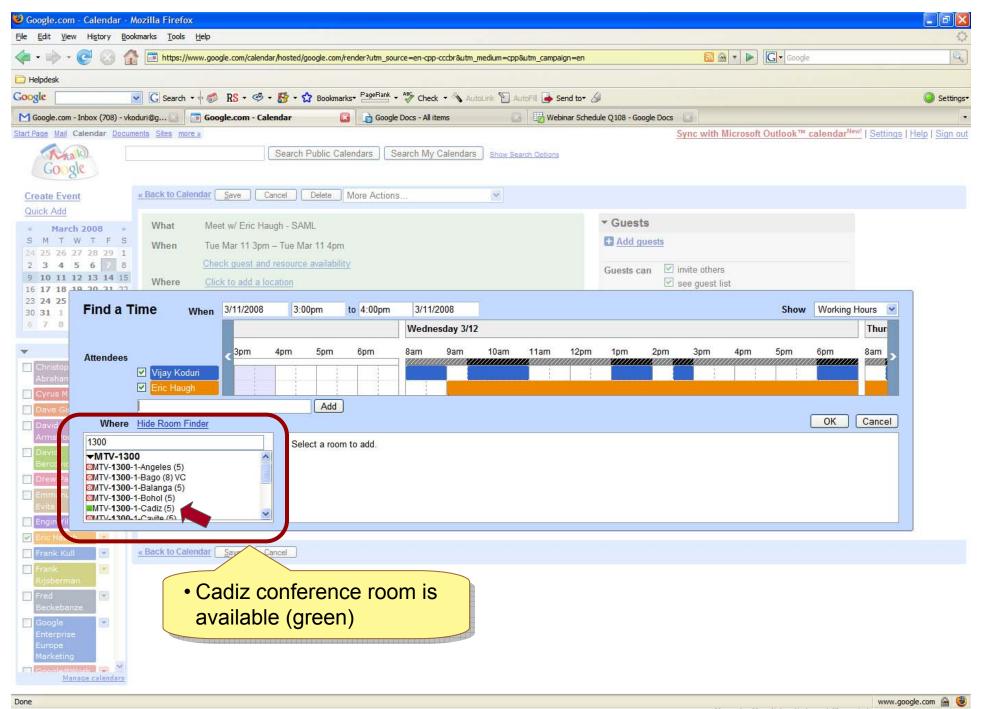


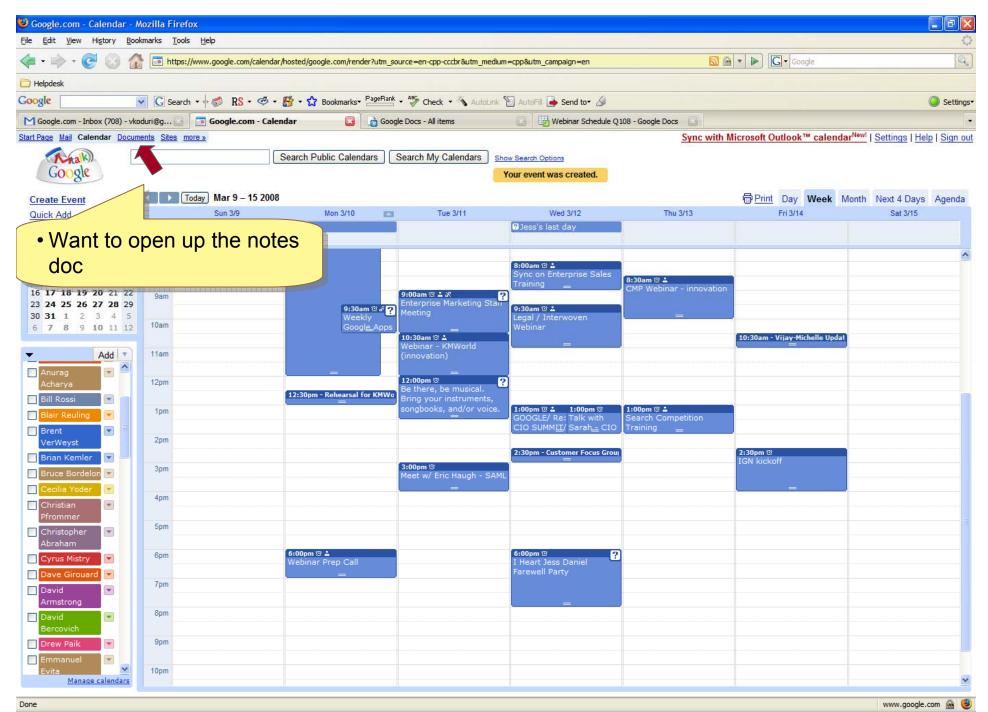


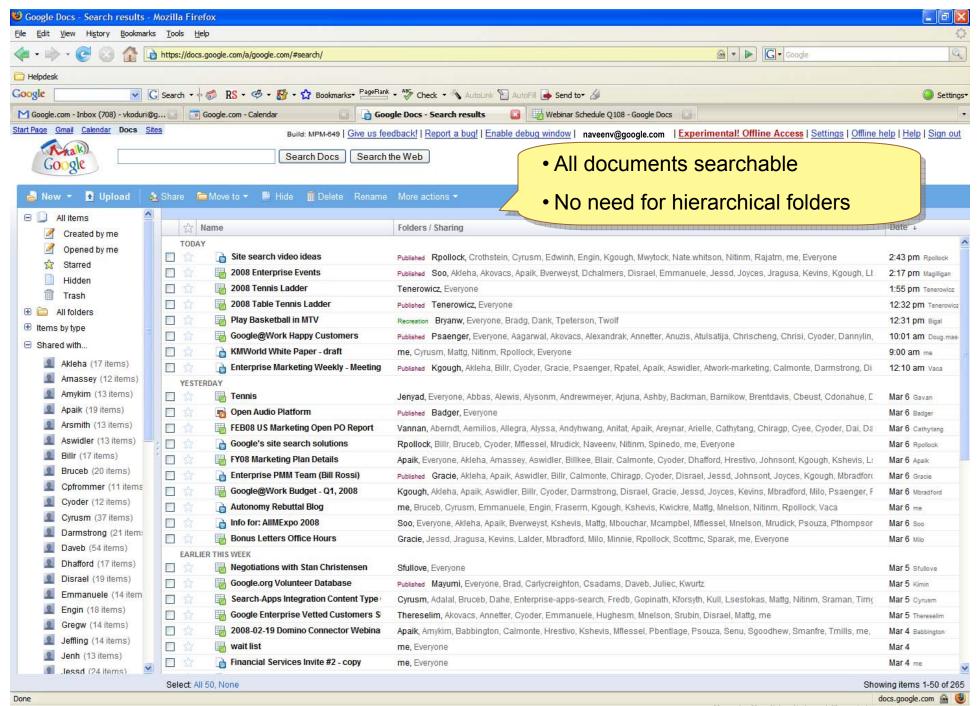


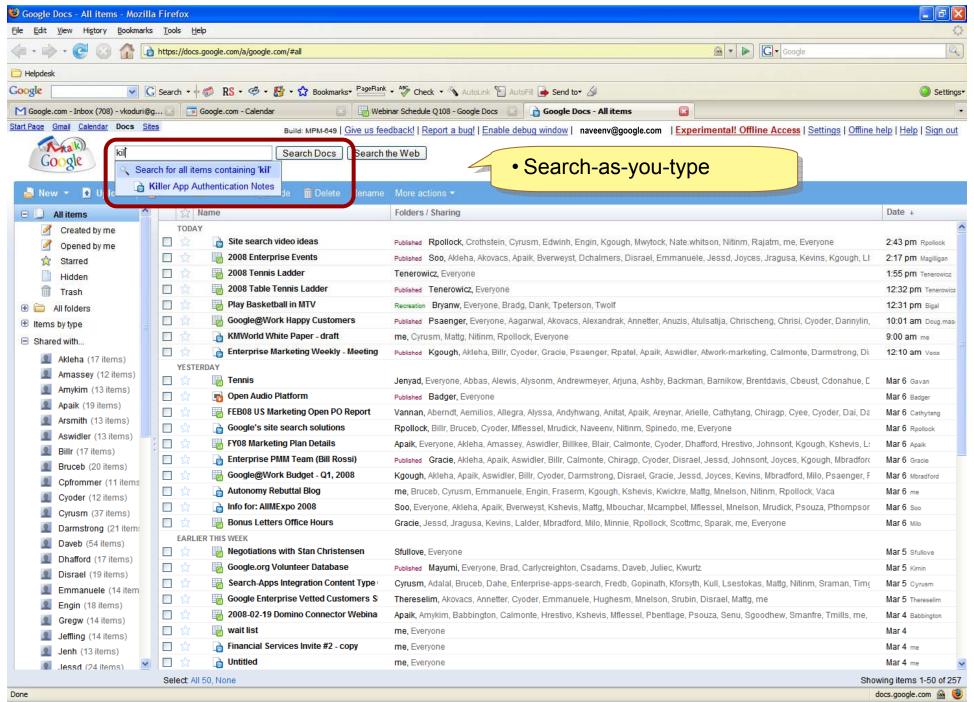


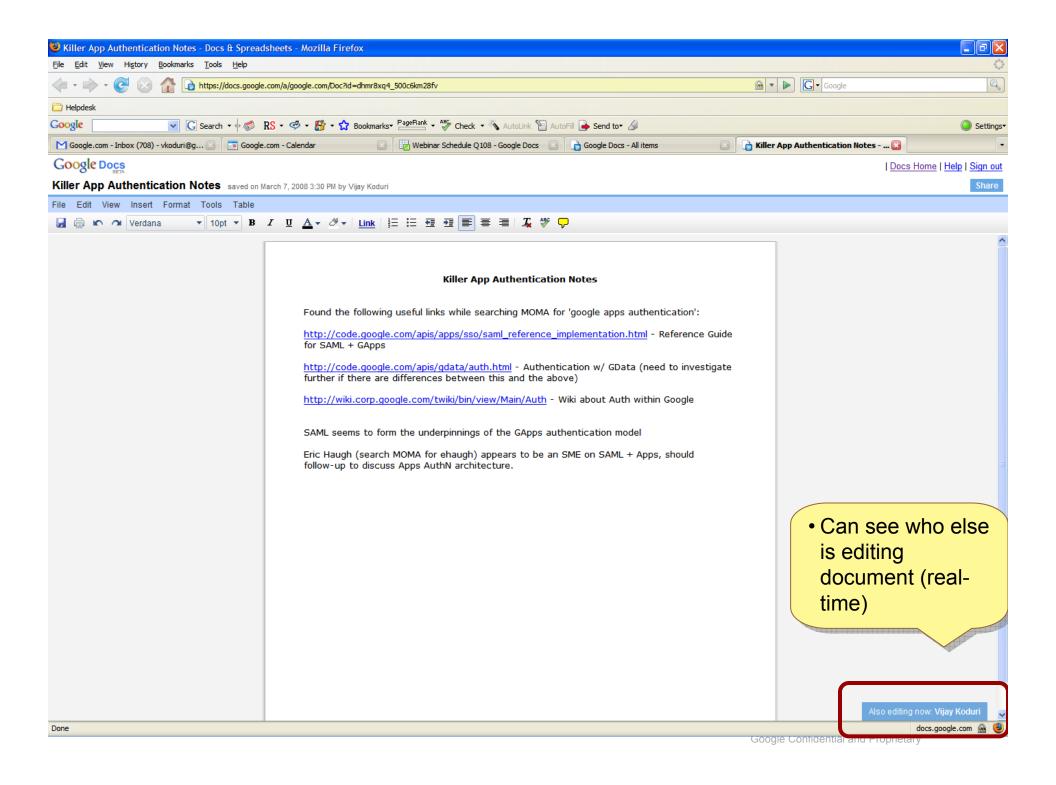


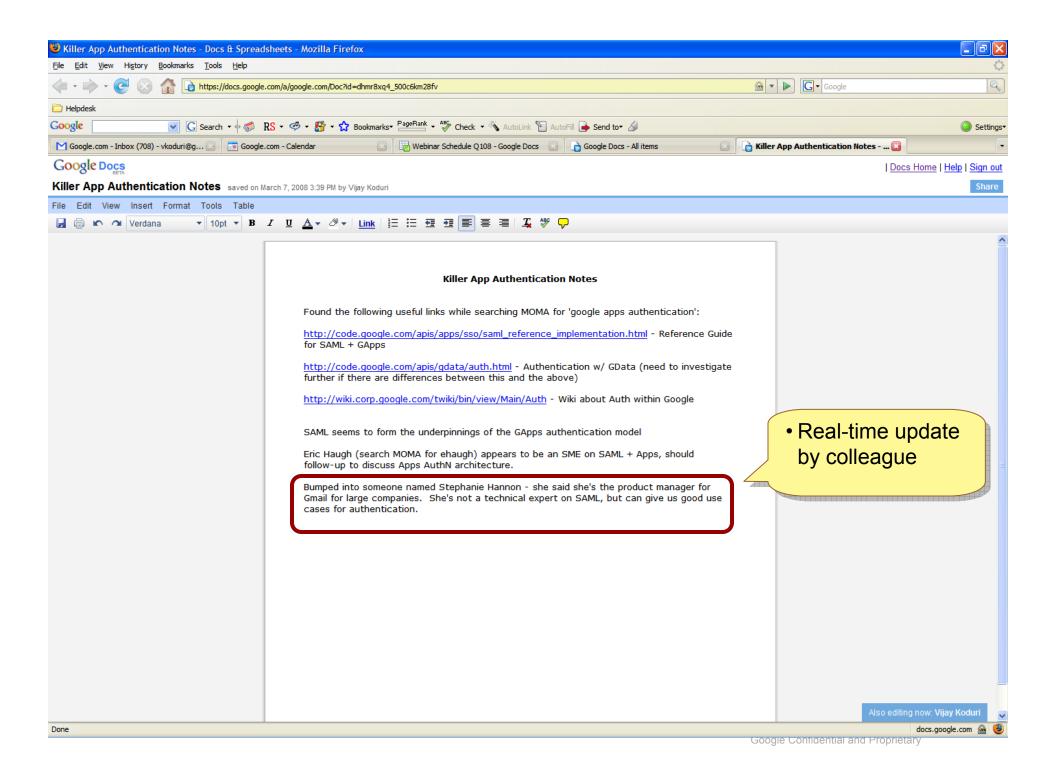


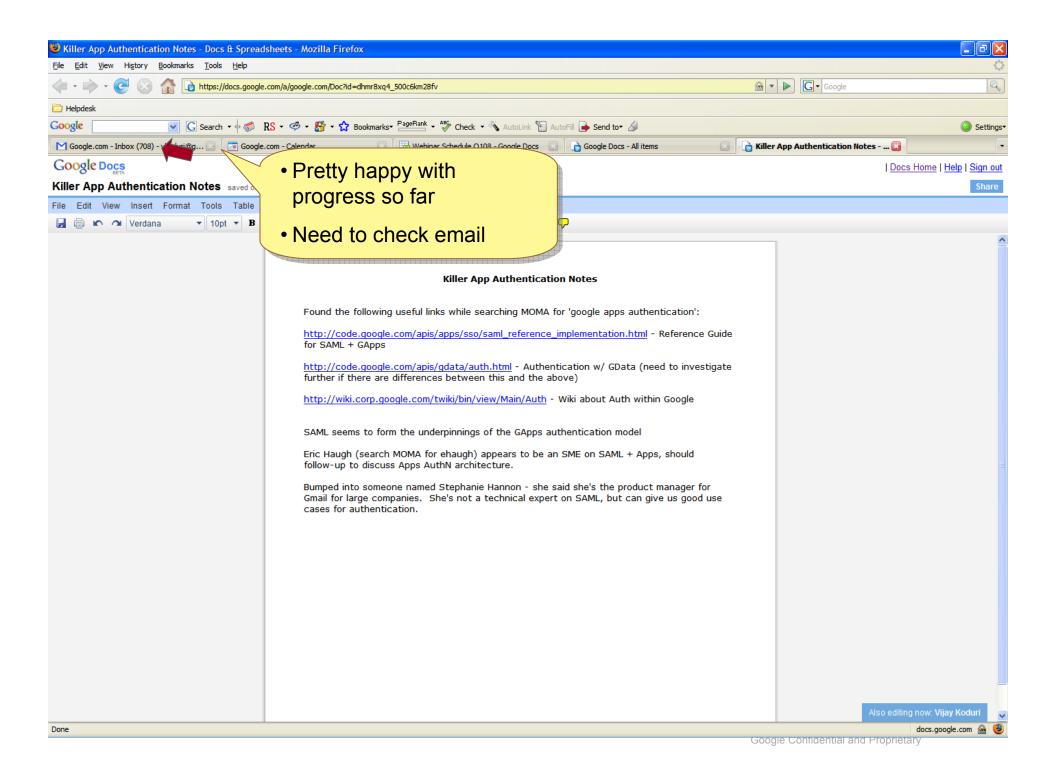


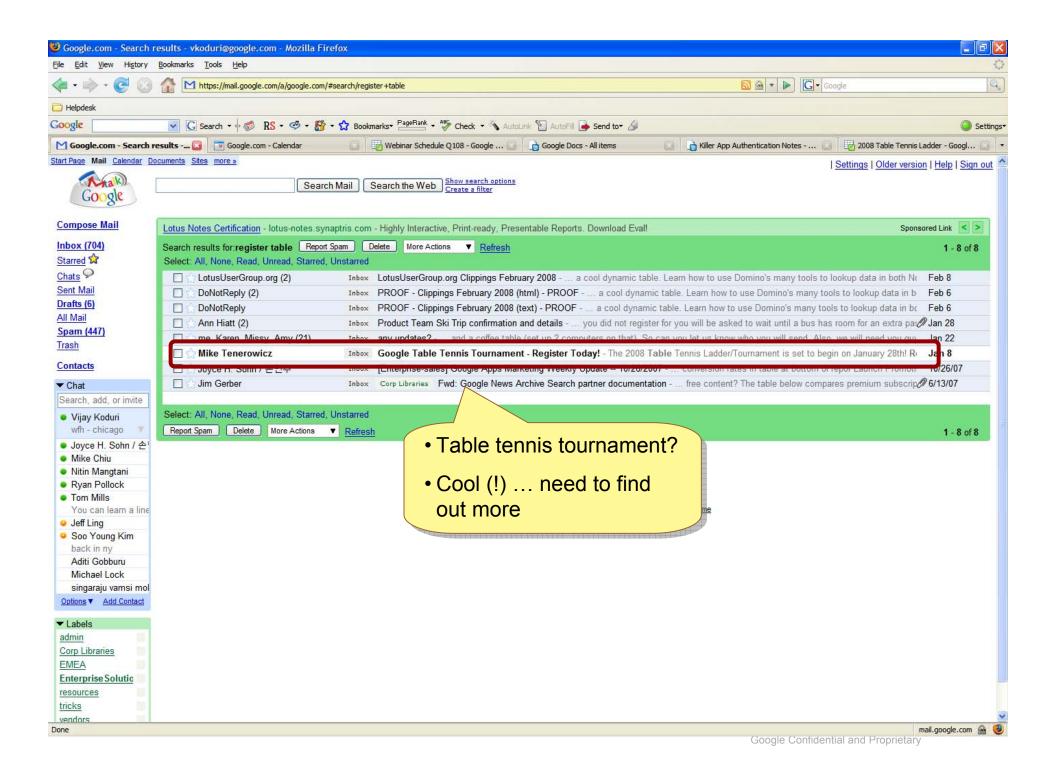


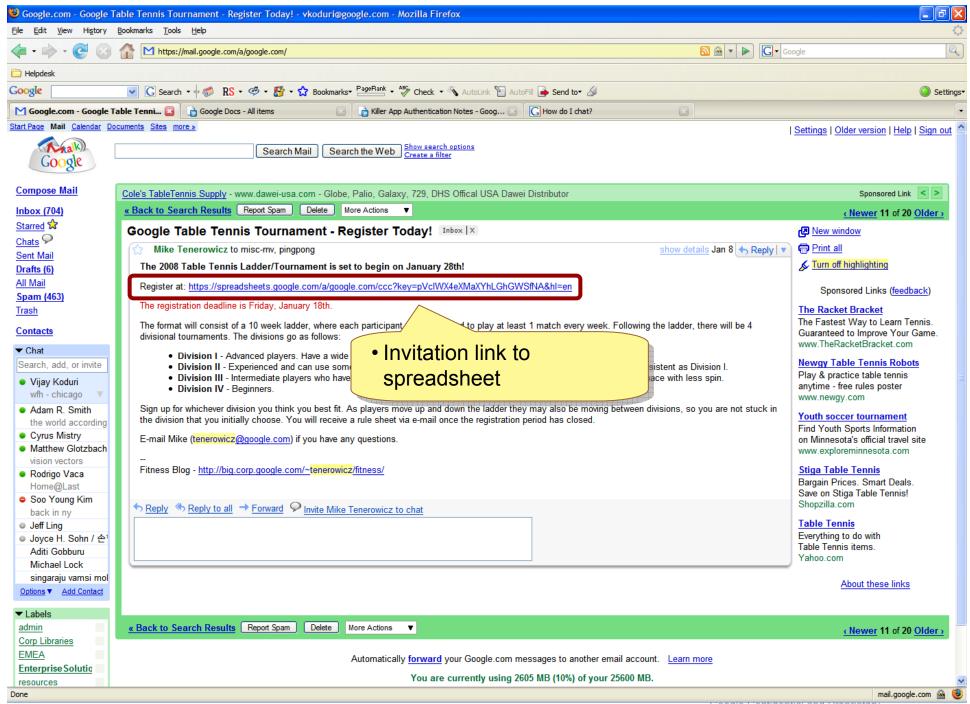


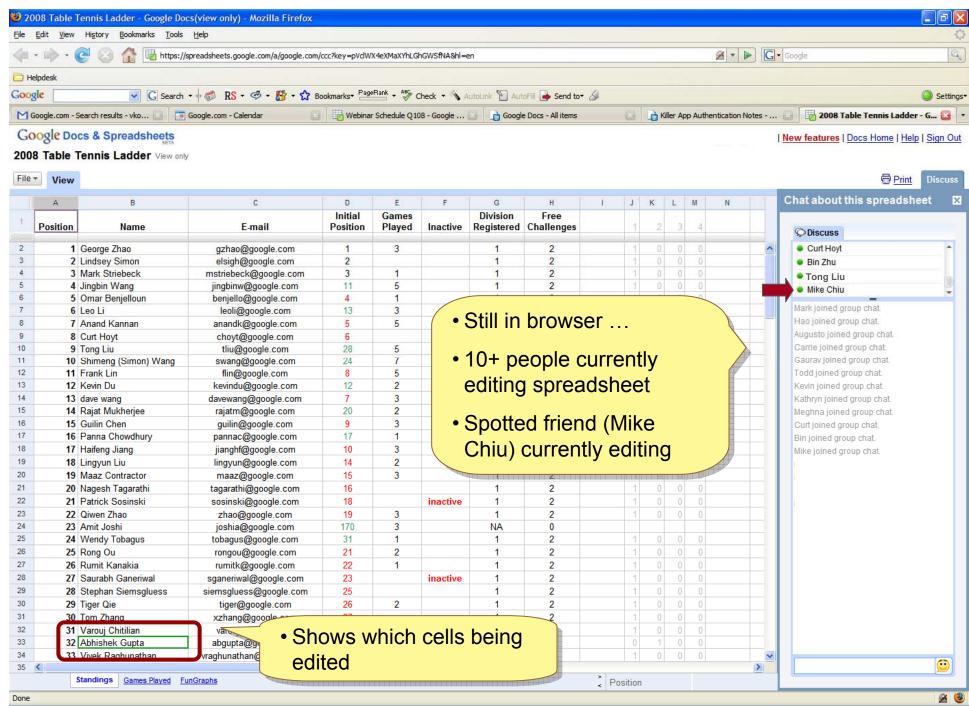


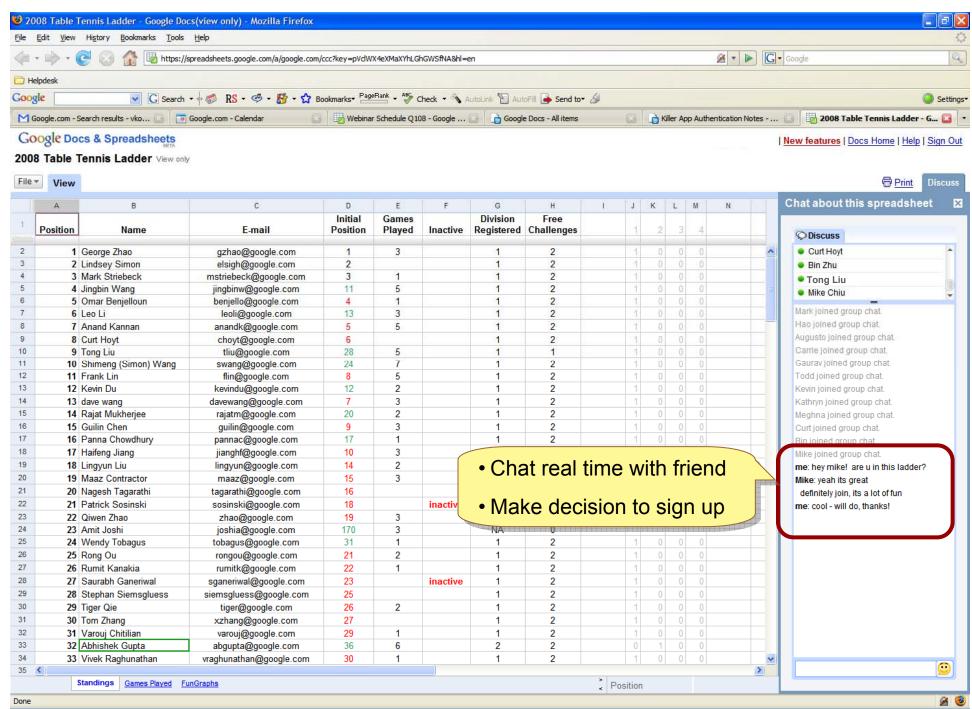












Innovation = Discovery + Collaboration (+ Fun!)

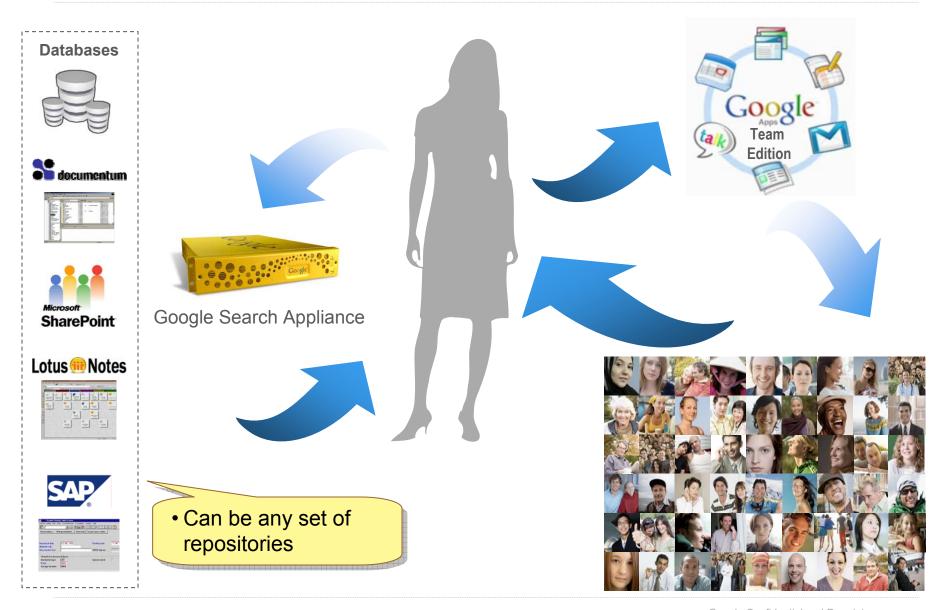
## Innovation = discovery + collaboration





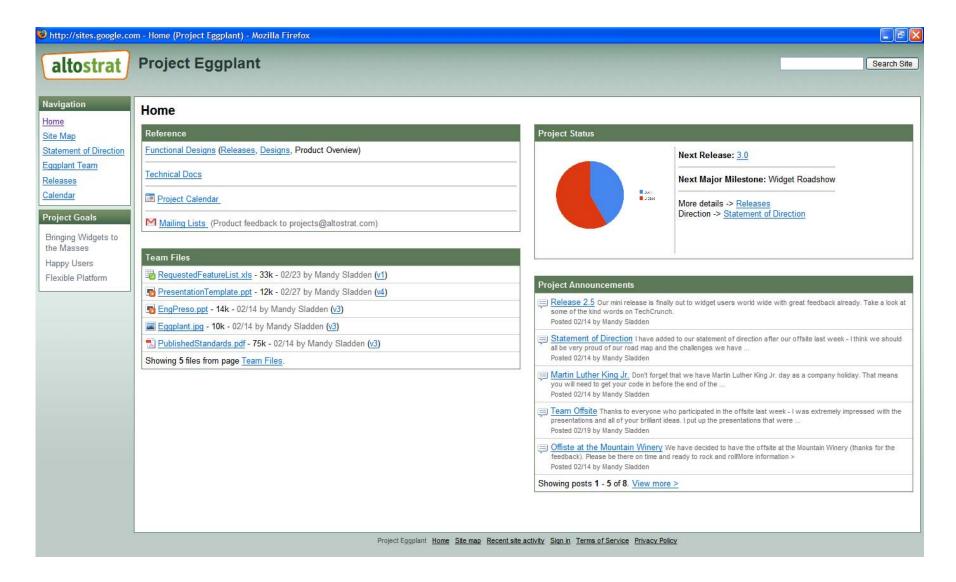
## Innovation = discovery + collaboration





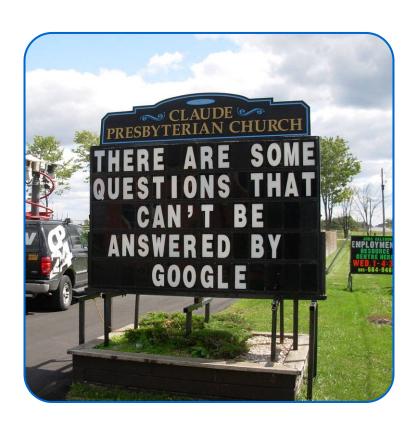
#### Google Sites: New way to share information





# Questions?





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