

# Let The User Drive

Lynn Baumeister  
Cirque Interactive LLC  
301-585-5307  
[lynn@cirqueinteractive.com](mailto:lynn@cirqueinteractive.com)

# Background



Human-Computer Interaction

Consultant in usability,  
accessibility (section 508),  
and interaction design

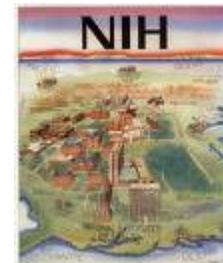
Industry,  
non-profits

+

Government



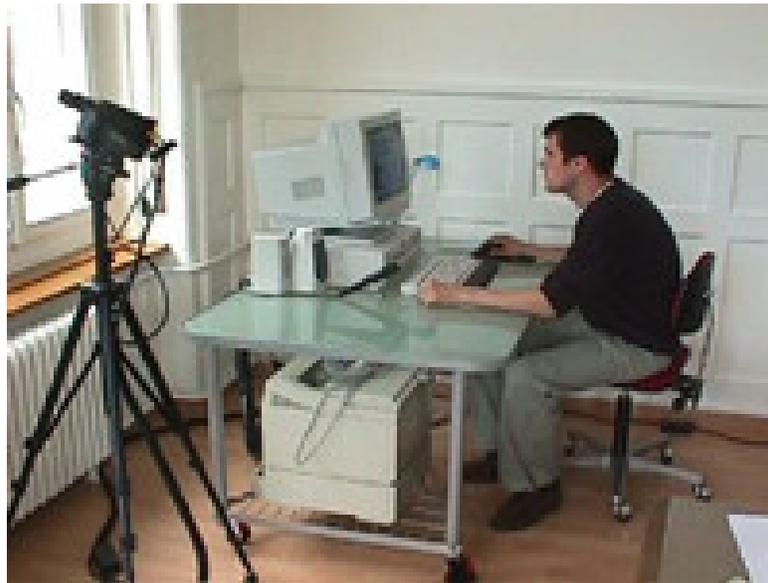
NATIONAL  
CANCER  
INSTITUTE



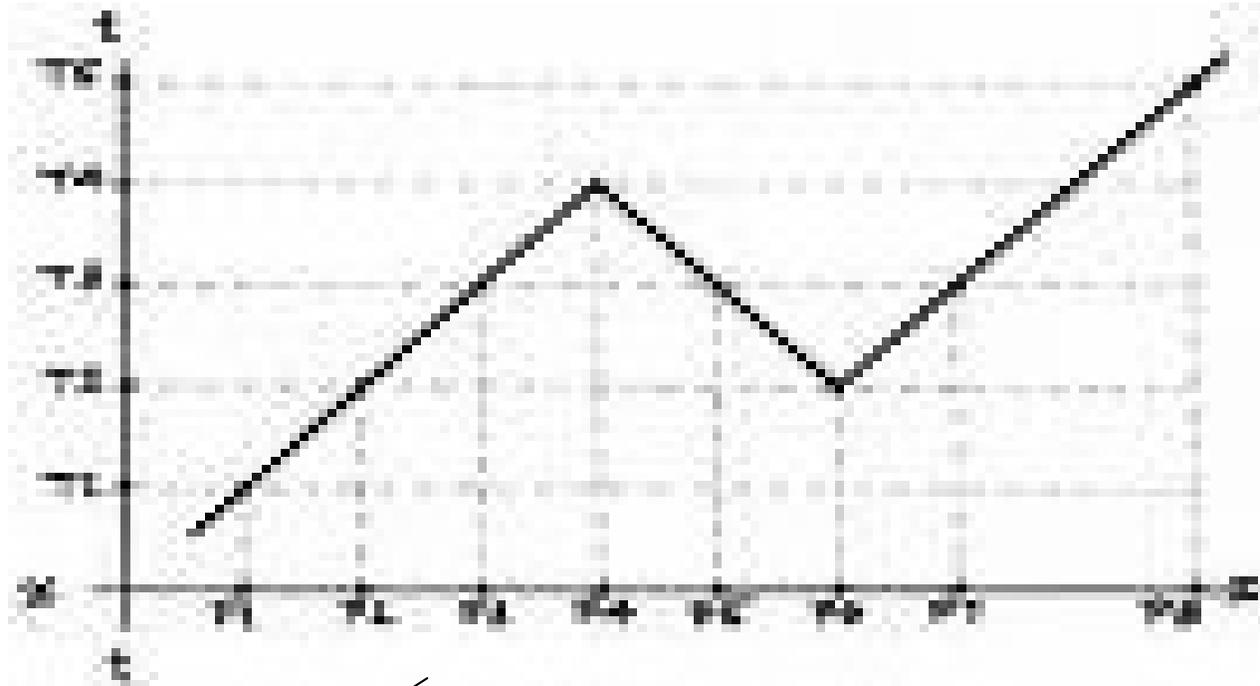
# Why do usability testing (UT)?

- Real data
  - Captures the actions and reactions of actual people working with the site
  - Shows areas where the site is working well
  - Shows areas where the site isn't working well
- Iterative testing allows for incremental improvement

Standard UT format – each participant moves through a set or pre-scripted tasks



# Benefit - Consistency



Measurable results  
across participants

# Benefit: Confidence due to consistency

7 out of 8 participants successfully located the pamphlet “Clinical Trials at NIH”.



6 out of 8 participants couldn't locate the contact person for the Genetic Variation program.



# An alternative: Let the user drive (more or less)



# What's critical?



Motivated participants

# Benefit: Starting gambits

Where do participants begin?

Why do they begin there?



Observer

How do I figure out what this site is all about?  
I wonder if they have information on xxx?



Participant

# Benefits: Follow-up activities

Are they done or do they need additional information?

What information do they need?

Why?

Can they find it?



Observer

This looks interesting, but now I need to know about ....



# Each participant will have different interests



I'm looking for funding opportunities

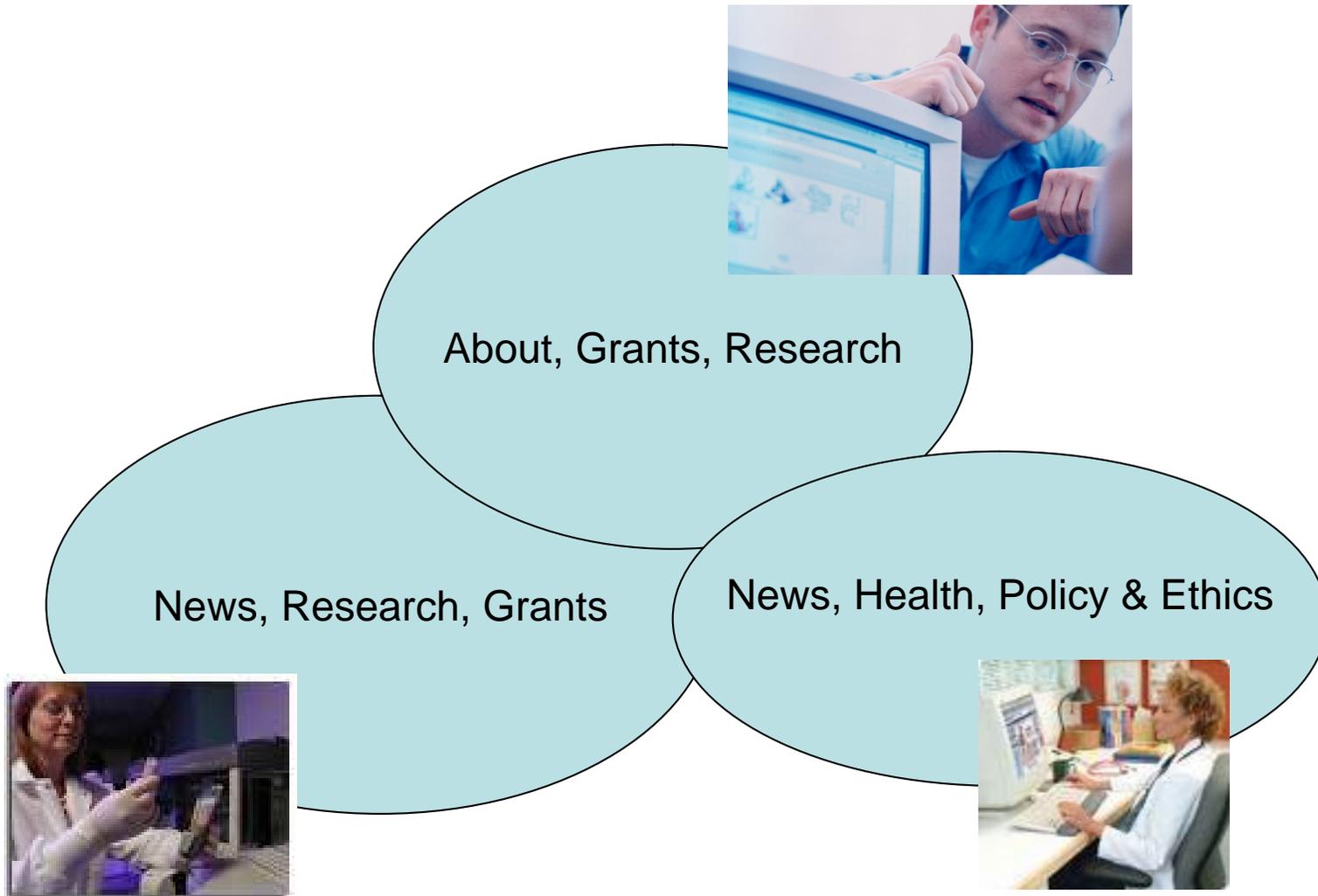


I'm looking for sequencing proposals



I'm looking for health information.

# There will be overlap, especially on top-level pages



# Results are a bit more unpredictable

Standard UT



Qualitative

Quantitative

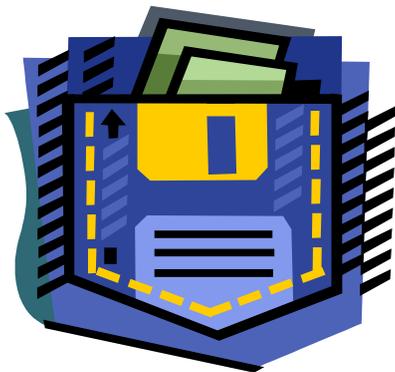
Let the user drive



Qualitative

Quantitative

# Getting feedback on specific pages



Have pre-scripted tasks in your back pocket ready to use. These should present scenarios/tasks designed to make it likely that the participant will drive through, or to, a specific page.

Tack these at the end -- IF the participant hasn't already visited the specific page(s) on their own.

# Genuine live experiences!

## NHGRI extranet (genome.gov)

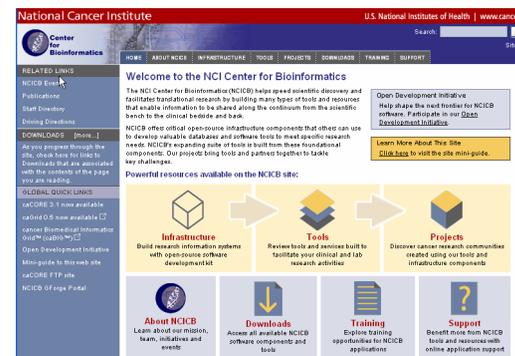


## NHGRI intranet (NHGRInside)



Funded through the  
NIH Set Aside Evaluation Program

## NCICB extranet



# NHGRI – why Let the User Drive?

Looking to engage wider audience in testing (more participants, each participating for shorter period of time)  
More closely simulate real use

The screenshot displays the NHGRI website interface. At the top, the logo for 'genome.gov National Human Genome Research Institute' is visible, along with a search bar and navigation links for Home, About NHGRI, Newsroom, and Staff. A horizontal menu bar contains categories: Research, Grants, Health, Policy & Ethics, Educational Resources, and Careers & Training. The main content area is divided into several sections:

- Research:** Includes links for Intramural Research, Extramural Research, and Research FAQ.
- Grants:** Lists Funding Opportunities, Active Grants Database, and Minority Funding.
- Health:** Provides Genetics FAQ, Clinical Research FAQ, and GARD Center information.
- Policy & Ethics:** Covers Privacy & Discrimination, Genetics & the Law, and Legislative Database.
- Educational Resources:** Offers Fact Sheets, Speaking About Genetics, and Talking Glossary.
- Careers & Training:** Features Research Training, Educational Opps, and Working at NHGRI.
- Newsroom:** Contains an 'About NHGRI' link and a featured article titled 'Powerful Insights From Rare Problems' by Dr. William Gahl, discussing 'Genomics in Action' and its focus on rare genetic disorders like Chediak-Higashi disease.
- Other News:** Includes 'NIH Seeks Input on Proposed Repository for Genetic Information', 'Report Underscores Need For Transdisciplinary Research', and 'Technology Development RFAs Released for ENCODE Project'.
- Calendar:** Lists upcoming events such as 'Nucleotide and Protein Sequence Analysis I' and 'DIR Seminar Series'.

# Common Starting Gambit: Figure just what NHGRI was

News Releases  
About NHGRI  
Cruise through the top-level tab

The screenshot shows the NHGRI website homepage. At the top, there is a search bar and navigation links for Home, About NHGRI, Newsroom, and Staff. Below this is a horizontal menu with tabs for Research, Grants, Health, Policy & Ethics, Educational Resources, and Careers & Training. The Research tab is highlighted. On the left side, there is a vertical navigation menu with categories: Research (Intramural Research, Extramural Research, Research FAQ), Grants (Funding Opportunities, Active Grants Database, Minority Funding), Health (Genetics FAQ, Clinical Research FAQ, GARD Center), Policy & Ethics (Privacy & Discrimination Genetics & the Law, Legislative Database), Educational Resources (Fact Sheets, Speaking About Genetics, Talking Glossary), Careers & Training (Research Training, Educational Opps, Working at NHGRI), and Newsroom (About NHGRI). The main content area features a 'DAGN Highlights NOW' section with a featured article titled 'Powerful Insights From Rare Problems' about Dr. William Gahl's research on Chediak-Higashi disease. Below this are several other news items: 'NIH Seeks Input on Proposed Repository for Genetic Information', 'Report Underscores Need For Transdisciplinary Research', 'Technology Development RFAs Released for ENCODE Project', and 'Two Requests for Application (RFA) are available to fund development of new technologies for the efficient, comprehensive, high-throughput'. On the right side, there is a 'The Human Genome Project' section with a link to 'Read the story behind the Human Genome Project', a 'Newsroom' section with links to 'NHGRI Awards \$54 Million to Three Centers of Excellence in Genomic Science', 'New Findings Offer More Complete View of Breast Cancer Gene Mutations in U.S. Population', 'New Paradigm Will Help Identify Leads for Drug Discovery', and 'NHGRI Announces Latest Sequencing Targets', and a 'Calendar' section with links to 'Nucleotide and Protein Sequence Analysis I' and 'DIR Seminar Series'.

# Other Starting Gambits: Skip the big picture, dive right in

- Do these guys do funding (can I get money)?
- Is there anything here (tools, data) that I can use?
- These guys should have info on the HGP ... will it tell me why they sequenced the human genome?
- What laws about genetic testing apply in my state?
- Who is the health information written for?
- What research on Parkinson's are they doing?

# Many participants visited the Research page. That provided feedback on its success in defining Intramural vs. Extramural in lay terms



Most participants “puzzled” out the intramural versus extramural distinction ... after they eliminated the possibility that this was about sports.

But not all did.

One participant, a faculty researcher, thought the right was a list of projects supported by the organizations on the left.

# Follow-up behavior

# Looking for funding



## Program Announcements by Category:

- ◆ [Research](#)
- ◆ [Ethical, Legal and Social Implications \(ELSI\) Program](#)
- ◆ [Training and Career Development](#)
- ◆ [Minorities and Special Populations](#)

## Program Announcements by Program Area:

- ◆ [Sequences, Maps and BAC Libraries Program](#)
- ◆ [Genetic Variation Program](#)
- ◆ [Genome Technology Program](#)
- ◆ [Functional Analysis Program](#)
- ◆ [Genome Informatics and Computational Biology Program](#)
- ◆ [Ethical, Legal and Social Implications \(ELSI\) Research Program](#)
- ◆ [International HapMap Project](#)
- ◆ [Centers of Excellence in Genomic Science \(CEGS\)](#)
- ◆ [The ENCODE Project](#)
- ◆ [The Knockout Mouse Project](#)
- ◆ [The Cancer Genome Atlas](#)

# Looking for funding: follow-up



Who else have they (NHGRI) funded in the past?

In what amounts?

Can I find previous funded proposals?

What spin are they looking for?

# Looking for internships



# Looking for internships



Dec. 8, 2005	<a href="#">Physician-Scientist Development Program</a>	<ul style="list-style-type: none"> <li>◆ Board-certified physicians or eligible in an appropriate specialty</li> <li>◆ Training complete within the past five years</li> <li>◆ Research aptitude and commitment</li> </ul>	October 31
Dec. 5, 2005	<a href="#">Summer Internship Program in Biomedical Research</a>	<ul style="list-style-type: none"> <li>◆ Enrolled at least half-time in high school or college.</li> <li>◆ Citizens or permanent residents of the United States.</li> <li>◆ At least 16 years of age.</li> </ul>	March 1
Dec. 1, 2005	<a href="#">Combined Pediatrics and Medical Genetics Residency Program</a>	<ul style="list-style-type: none"> <li>◆ Successful completion of medical training at an accredited medical school</li> </ul>	July 1
May 13, 2005	<a href="#">Pre-Doctoral Intramural Research Training Award</a>	<ul style="list-style-type: none"> <li>◆ Currently enrolled in a doctoral program in the biomedical sciences</li> <li>◆ or Accepted to medical or graduate school</li> <li>◆ or College graduate applying for graduate or medical school the first year after graduation</li> <li>◆ U.S. citizen or permanent resident</li> </ul>	Applications accepted all year

# Looking for an internship: follow-up



Do they provide housing?

Where is the application?

What else do I need to send in?

How long is it?

# A few summarizing notes for genome.gov

- Helpful to see the range of starting gambits
- Cross-linking critical
  - Plan ahead and provide links to likely follow-up material
- Health content praised (this validated input from interviews)
- Specific pages
  - Research
    - New layout not 100% effective but considerable better than old design
  - Training opportunities
    - New layout for training opportunities (table) worked well - easier to scan

# NHGRI Intranet

- Why are usage levels for the intranet low?
- Are there usability issues?
- Or are there other factors?

The screenshot displays the NHGRI Intranet homepage with a navigation bar at the top containing: Administrative Services, Employee Information, Information Technology, Scientific Resources, and Work/Life. Below the navigation bar are several content sections:

- Administrative Services:** The Assignment Desk, Travel, Timekeeping, More...
- Employee Information:** NEWS & ALERTS, Policies and Guidelines, Employee Ethics, More...
- Information Technology:** IT ALERTS, Computer Security, Remote Connectivity, More...
- Scientific Resources:** SIU, Library Resources, Lectures & Events, More...
- Work/Life:** Counseling Services, Genomes On Your Side, Genome Camera, More...

Other visible content includes:

- Pic of the Month:** A group photo from the NHGRI Town Hall Meeting and Awards Ceremony on January 18th, 2005.
- Today at NHGRInside:** A welcome message and a list of news items: The NIH Business System, Genomes On Your Side: Current Minutes, Current Edition: eNewsNotes, New Ethics Regulations Memorandum, and Read More About Employee Ethics.
- Here's the Latest:** A graphic for the Town Hall Meeting and Awards Ceremony on January 18th, 2005, from 3:00-4:30 p.m. in the Natcher Main Auditorium.
- Blacks In Government (BIG) African American History Month Program:** Margaret Dureke, J.D., JAHs Enterprises, February 18th, 12:00 p.m., Building 31C, Science Events.
- Novel Drug Delivery Systems for Cancer:** Robert S. Langer, Ph.D., Massachusetts Institute of Technology, Nanotechnology Seminar Series, February 24th, 2:00 p.m., Lipsitt Auditorium, Science Events.
- NIH Roadmap Reception:** View the October 2004 NIH Roadmap Reception Webcast. A note indicates it is a Real Video file requiring RealPlayer.

At the bottom left, it says "Connecting to inside.genome.gov...". At the bottom right, there is a "Search the Site" box with a "GO" button and a "Logout" link.

# Contextual Interview + Informal Usability Test



Conversation:  
What do you do?  
What online tools do you use  
Do you use the intranet?  
What areas of the intranet do you use?  
*Etc.*



Actual usage:  
Have them show me how use the intranet  
Ask about items on the intranet that they mention  
*Etc.*

# Show me how you get there and use it ... (an informal UTest)



I use it to find the IRB forms... *and then can not locate them.*



I like to view photos from the staff picnic... *and goes right to them.*



I use Manuscript Tracking ... *and has difficulty locating it*

# Observations: Many paths to resources



Bookmark in browser



Desktop shortcut

Sometimes perceived as one of the less preferred options



Send an email

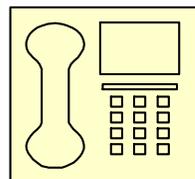
Look for received email



Intranet



Turn around and ask someone



Make a phone call

# Plus – old home page didn't provide sufficient navigation guidance

Functional/work tool  
= 20%

The screenshot shows the NHGRI website home page with a complex navigation structure. At the top, there are five main menu categories: Administrative Services, Employee Information, Information Technology, Scientific Resources, and Work/Life. Each category has a list of sub-links. For example, 'Administrative Services' includes 'The Assignment Desk', 'Travel', 'Timekeeping', and 'More...'. 'Employee Information' includes 'NEWS & ALERTS', 'Policies and Guidelines', 'Employee Ethics', and 'More...'. 'Information Technology' includes 'IT ALERTS', 'Computer Security', 'Remote Connectivity', and 'More...'. 'Scientific Resources' includes 'STU', 'Library Resources', 'Lectures & Events', and 'More...'. 'Work/Life' includes 'Counseling Services', 'Genomes On Your Side', 'Genome Camera', and 'More...'. Below the navigation is a 'Pic of the Month' section featuring a group photo of people at an awards ceremony. To the right is a 'Today at NHGRI Inside' section with a 'Welcome' message and a list of news items. Further right is a 'Here's the Latest' section with a 'Town Hall Meeting and Awards Ceremony' announcement. At the bottom right is an 'Inside Look' section with a 'NIH Roadmap Reception' announcement. On the far right, there is a vertical sidebar with sections for 'Today's Weather', 'My NHGRI Inside', 'Short Cuts', 'Search the Site', and 'Logout'.

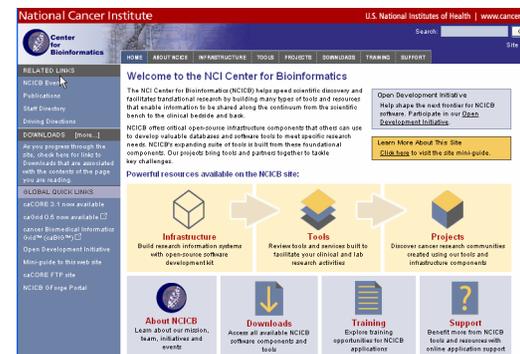
“USA Today”  
= 80%

# A few summarizing notes on NHGRInside –

- Staff have other paths most resources they commonly use
  - Bookmarks, desktop shortcuts, email, etc.
- Unique NHGRI content is the value-add
  - Staff Photo Directory
  - Manuscript Tracking
  - Tech Transfer forms
  - Scientific Illustration Unit
  - Genomes on Your Side (when new material)
  - Genome Camera (when new material)
- Home page needed better balance of news and “take me to the things I use quickly”

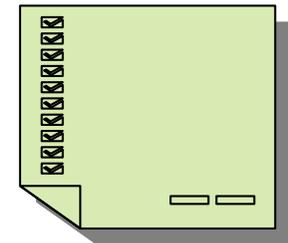
# NCICB

- Portal site that served a wide audience
  - Highly highly technical
  - Difficult to formulate tasks that would work across all audiences or even audience groups
- Redesign – important to know if current users could still find things



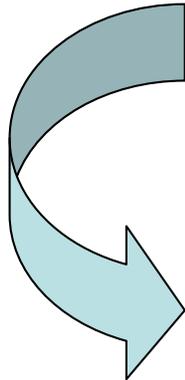
# Prep

- Participants sent a questionnaire
  - Background
  - About their job, on-line tools they use, etc.
  - What they used on the current site & how often (for existing users)



Note: Most sessions done remotely using web-conferencing software (Centra or Breeze) because participants were geographically scattered.

# Questionnaire + Conversation + Informal Usability Test



## Conversation:

You mentioned in your questionnaire that you use caDSR – can you tell me more about that?

You mentioned in your questionnaire that you work on mouse models –

*Etc.*



## Actual usage:

Use the site locate the materials you use form caDSR...

Use the site to mouse models ...

*Etc.*

# Starting Gambits: tended to use middle blocks

The screenshot displays the website for the National Cancer Institute Center for Bioinformatics. At the top, there is a red header with the text "National Cancer Institute" and "U.S. National Institutes of Health | www.cancer.gov". Below this is a blue navigation bar with a search box and a menu containing "HOME", "ABOUT NCICB", "INFRASTRUCTURE", "TOOLS", "PROJECTS", "DOWNLOADS", "TRAINING", and "SUPPORT".

On the left side, there is a vertical sidebar with several sections: "RELATED LINKS" (including NCICB Events, Publications, Staff Directory, and Driving Directions), "DOWNLOADS" (with a "more..." link and a description of the page's content), "GLOBAL QUICK LINKS" (listing caCORE 3.1, caGrid 0.5, cancer Biomedical Informatics Grid™, Open Development Initiative, Mini-guide, caCORE FTP site, and NCICB @Forge Portal).

The main content area features a "Welcome to the NCI Center for Bioinformatics" section. It includes a paragraph about the center's mission to speed scientific discovery and facilitate translational research. Below this is a section titled "Powerful resources available on the NCICB site:" which contains a flow diagram with three main categories: "Infrastructure" (Build research information systems with open-source software development kit), "Tools" (Review tools and services built to facilitate your clinical and lab research activities), and "Projects" (Discover cancer research communities created using our tools and infrastructure components). To the right of the welcome text are two call-to-action boxes: "Open Development Initiative" and "Learn More About This Site".

At the bottom of the main content area, there are four distinct blocks: "About NCICB" (Learn about our mission, team, initiatives and events), "Downloads" (Access all available NCICB software components and tools), "Training" (Explore training opportunities for NCICB applications), and "Support" (Benefit more from NCICB tools and resources with online application support).

# Observations

## Surprise

- Most participants not aware when they had moved to another site



# A few summarizing notes on NCICB

- About
  - Info in ABOUT hidden (directions, event, etc.)
    - Needed to provide more navigation help finding that info
- Tools
  - Needed A – Z listing in addition to categorical grouping
- Too bare bones
  - Lists of links worked for unambiguous terms (E.g., directions, events, calendar, staff list)
  - Generic terms (e.g., resources, tools, projects) and jargony terms needed brief explanatory blurbs.

# Review

Who did the driving?

# NHGRI extranet (genome.gov)

- Participant drove (up to them) + pre-scripted tasks (as needed)
  - 30 min session (some went longer)
  - Participants included externals and internals (staff).
  - Participants decided where to go
- Tacked-on pre-scripted tasks – IF the participant hadn't visited specific pages that the redesign team was particularly interested in.

# NGHRI intranet (NGHRInside)

- Initial interview => personalized tasks (driving to content of use/interest to participant)
  - 20-40 min session
  - In the participant's office so the work environment could be seen and the participant was using their own setup
  - Initial conversation/interview to elicit items that were used on the intranet (and why, how often, how important, etc.)
  - Participant asked to locate items of interest on the intranet
    - Helpful since areas of difficulty (and ease) could be observed as the participant navigated the site.

# NCICB redesign

- Pre-questionnaire => personalized tasks (driving to content of use/interest to participant).
  - 60 min session. First 10-20 minutes spent getting web-conferencing software working
  - Mix of new and existing users
  - Pre-questionnaire was used to elicit items that were used on the current site (existing users) or that would likely be of interest (new users)
  - Participant asked to use the NCICB site to locate those items of interest on the intranet
    - Helpful since areas of difficulty (and ease) could be observed as the participant navigated the site.
- Tacked-on pre-scripted tasks – IF the participant hadn't visited specific pages that the redesign team was particularly interested in.

# Summary

- **Benefits**
  - More closely simulates real use
  - Different paths into pages
  - Wider variety of pages and paths
  - Starting gambits
  - Follow-up needs
- **Draw backs**
  - Less quantitative data
  - Less control
- **Best of both worlds?**
  - Start with Let the User Drive
  - Tack on pre-scripted tasks

# NIH Evaluation Set-Aside Program

- <http://opasi.nih.gov/desa/eb/setaside.asp>
  - Express Award application is quite feasible (not overly time-consuming to complete)
  - The program staff is helpful
    - Answer questions
    - Review submissions and provide feedback so you can re-submit a stronger application.
  - Worth submitting an application