How to get thrown out of Whole Foods

Google
Mountain View
Spring ‘09

Krispin Leydon
krispin@alum.dartmouth.org

Background, Process

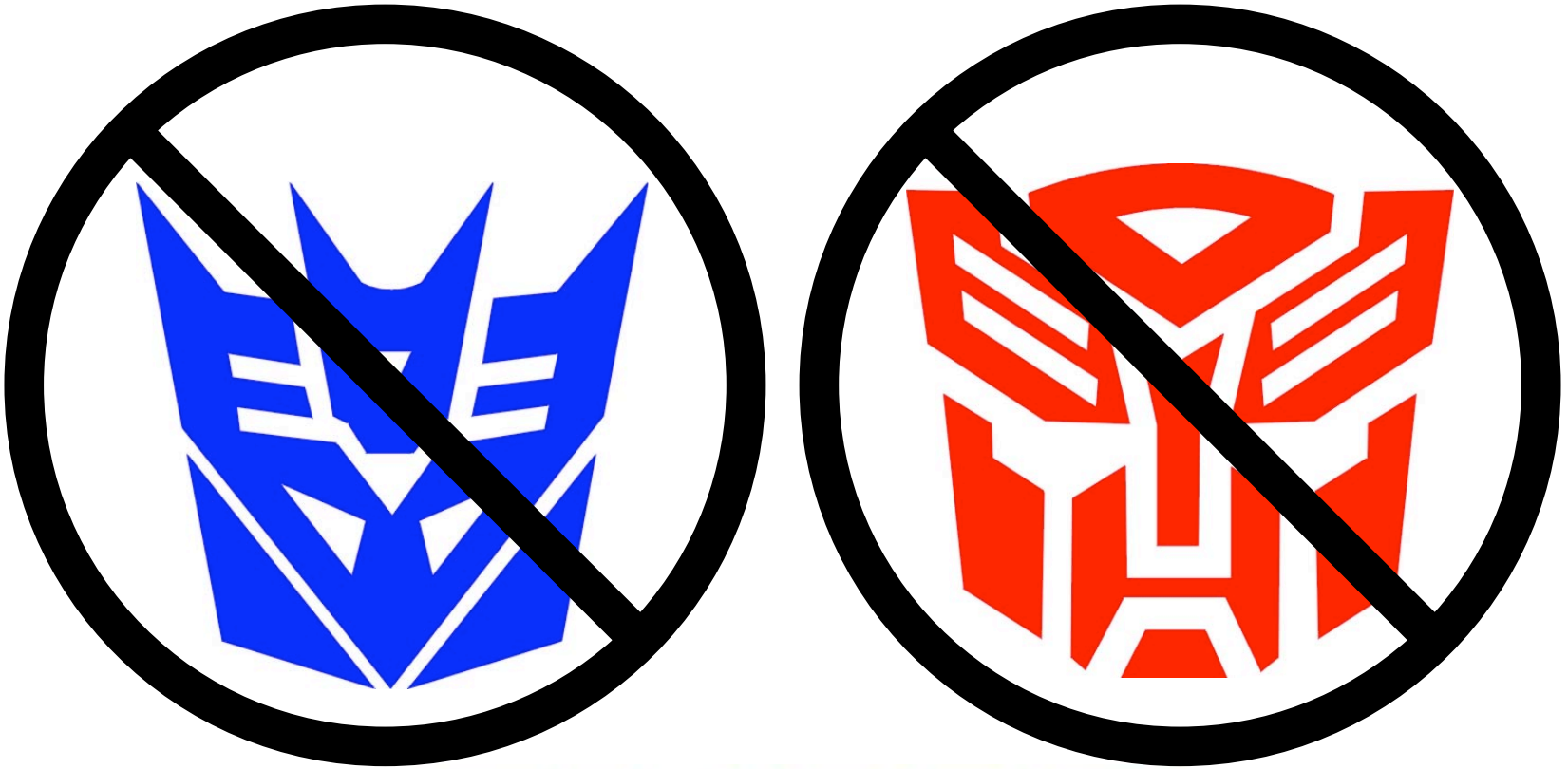
Design Challenge

Portfolio

Background

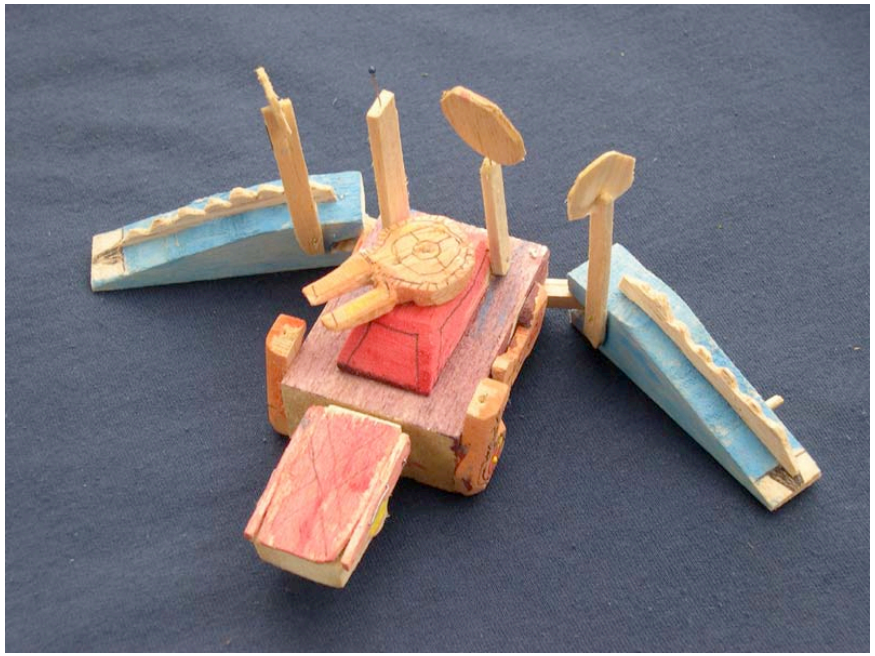
Background: Transformers

Background: Transformers



Background: Transformers

Background: Transformers



Background: Transformers

Background: Home

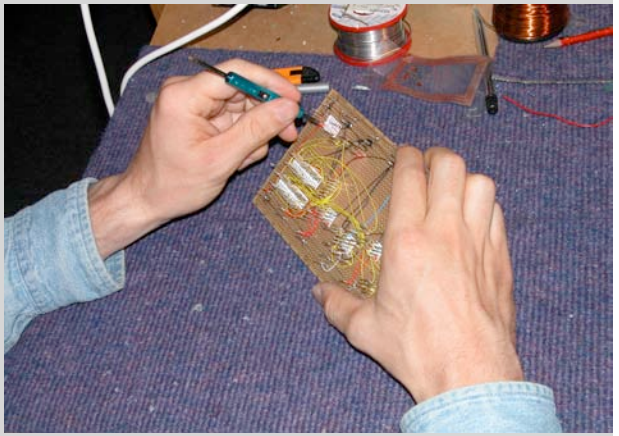
Background: High School



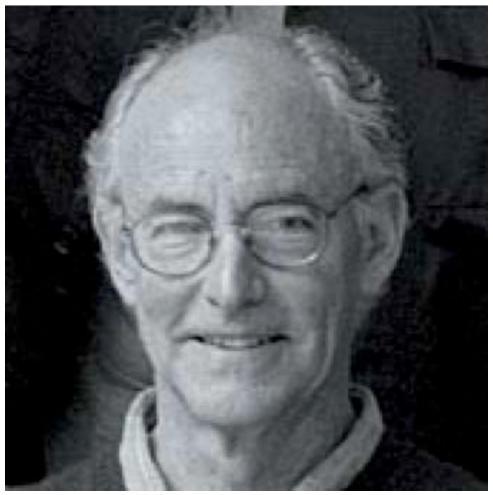


Background: Dartmouth College

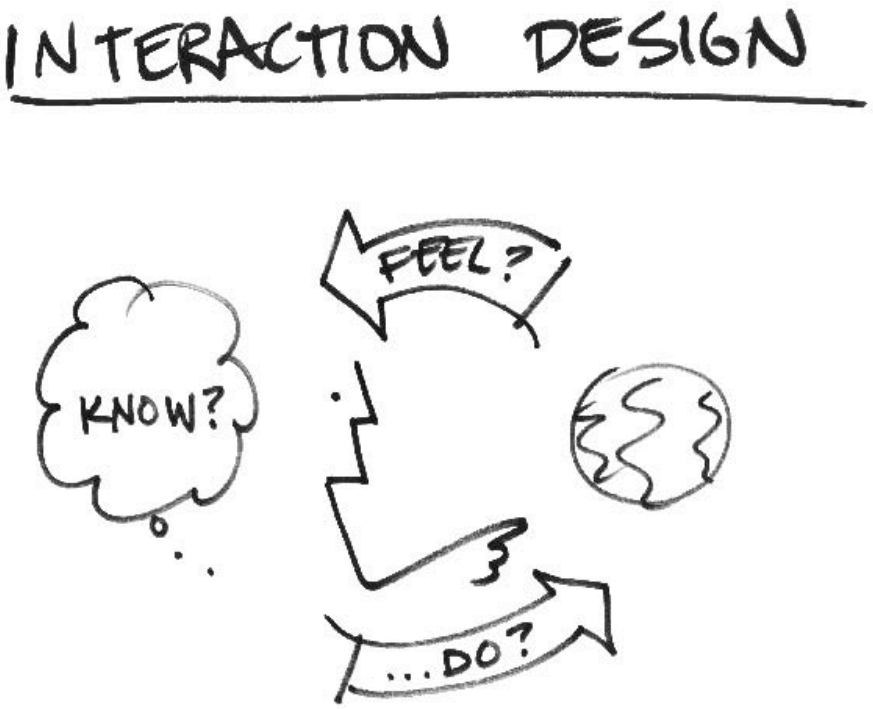
```
case 'Point'
 %Calculate contributions
 dP = F0*Const1./sqrt((X-X0).^2+(Y-Y0).^2);
 dF = -F0*Const1*(X-X0)./sqrt((X-X0).^2+(Y-Y0).^2);
 dFx = F0*Const1*(X-X0)./((X-X0).^2+(Y-Y0).^2).^1.5;
 dFy = F0*Const1*(Y-Y0)./((X-X0).^2+(Y-Y0).^2).^1.5;

 %Add contribution to P,F,Fx,Fy
 P=P+dP; F=F+dF; Fx=Fx+dFx; Fy=Fy+dFy;


case 'Line Flux'
 %Calculate contributions
 dP = -F0*Const2*log(sqrt((X-X0).^2+(Y-Y0).^2));
 dF = F0*Const2*atan2((Y-Y0),(X-X0));
 dFx = F0*Const2*(X-X0)./((X-X0).^2+(Y-Y0).^2);
 dFy = F0*Const2*(Y-Y0)./((X-X0).^2+(Y-Y0).^2);
```



Historical Context



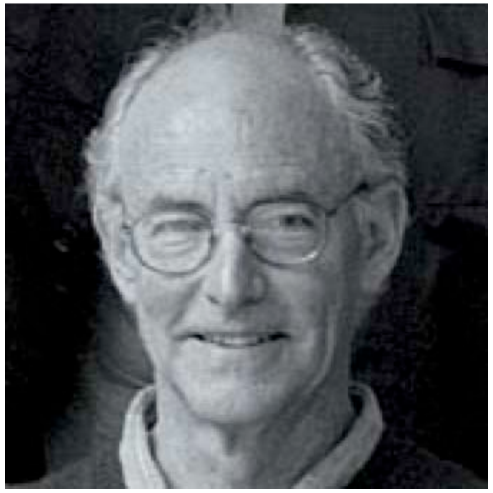
Bill Verplank



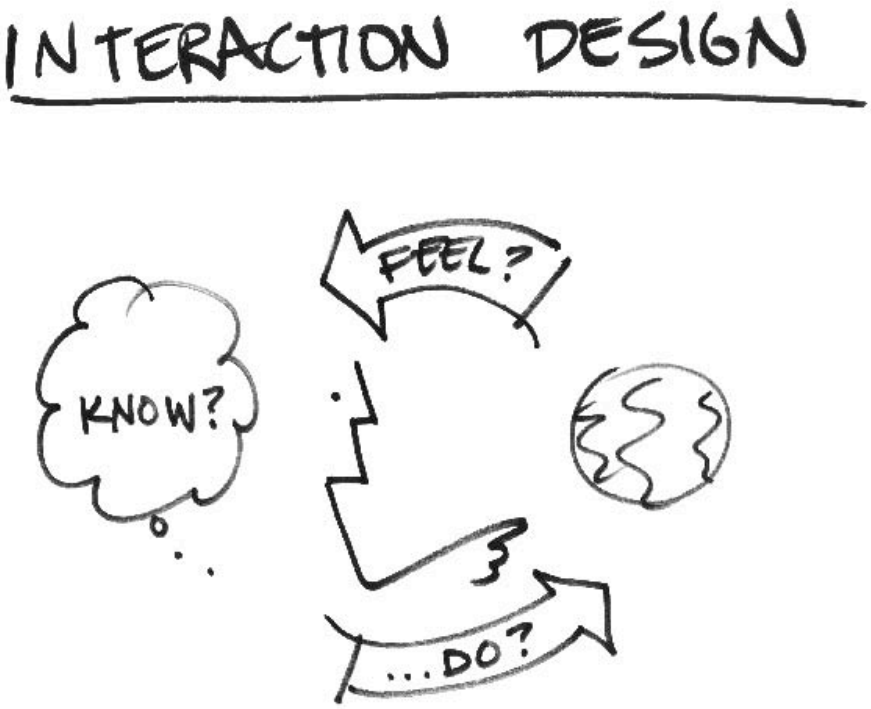
Plastic *is to* Industrial Design *as*

Computation *is to* Interaction Design

Historical Context



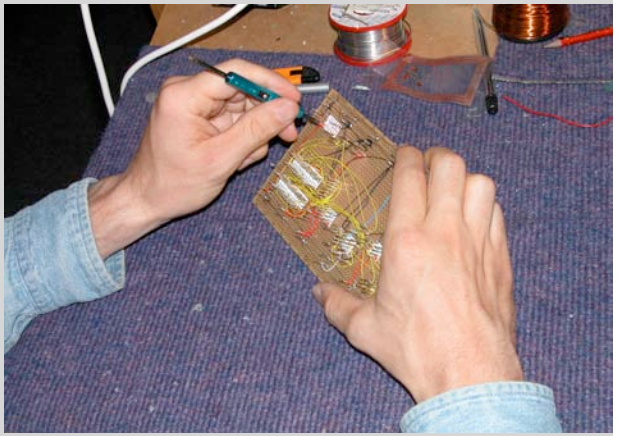
Bill Verplank



Interaction Design: The design of *representations* for *manipulation*

Background: Dartmouth College

```
case 'Point'
 %Calculate contributions
 dP = F0*Const1./sqrt((X-X0).^2+(Y-Y0).^2);
 dF = -F0*Const1*(X-X0)./sqrt((X-X0).^2+(Y-Y0).^2);
 dFx = F0*Const1*(X-X0)./((X-X0).^2+(Y-Y0).^2).^1.5;
 dFy = F0*Const1*(Y-Y0)./((X-X0).^2+(Y-Y0).^2).^1.5;

 %Add contribution to P,F,Fx,Fy
 P=P+dP; F=F+dF; Fx=Fx+dFx; Fy=Fy+dFy;


case 'Line Flux'
 %Calculate contributions
 dP = -F0*Const2*log(sqrt((X-X0).^2+(Y-Y0).^2));
 dF = F0*Const2*atan2((Y-Y0),(X-X0));
 dFx = F0*Const2*(X-X0)./((X-X0).^2+(Y-Y0).^2);
 dFy = F0*Const2*(Y-Y0)./((X-X0).^2+(Y-Y0).^2);
```



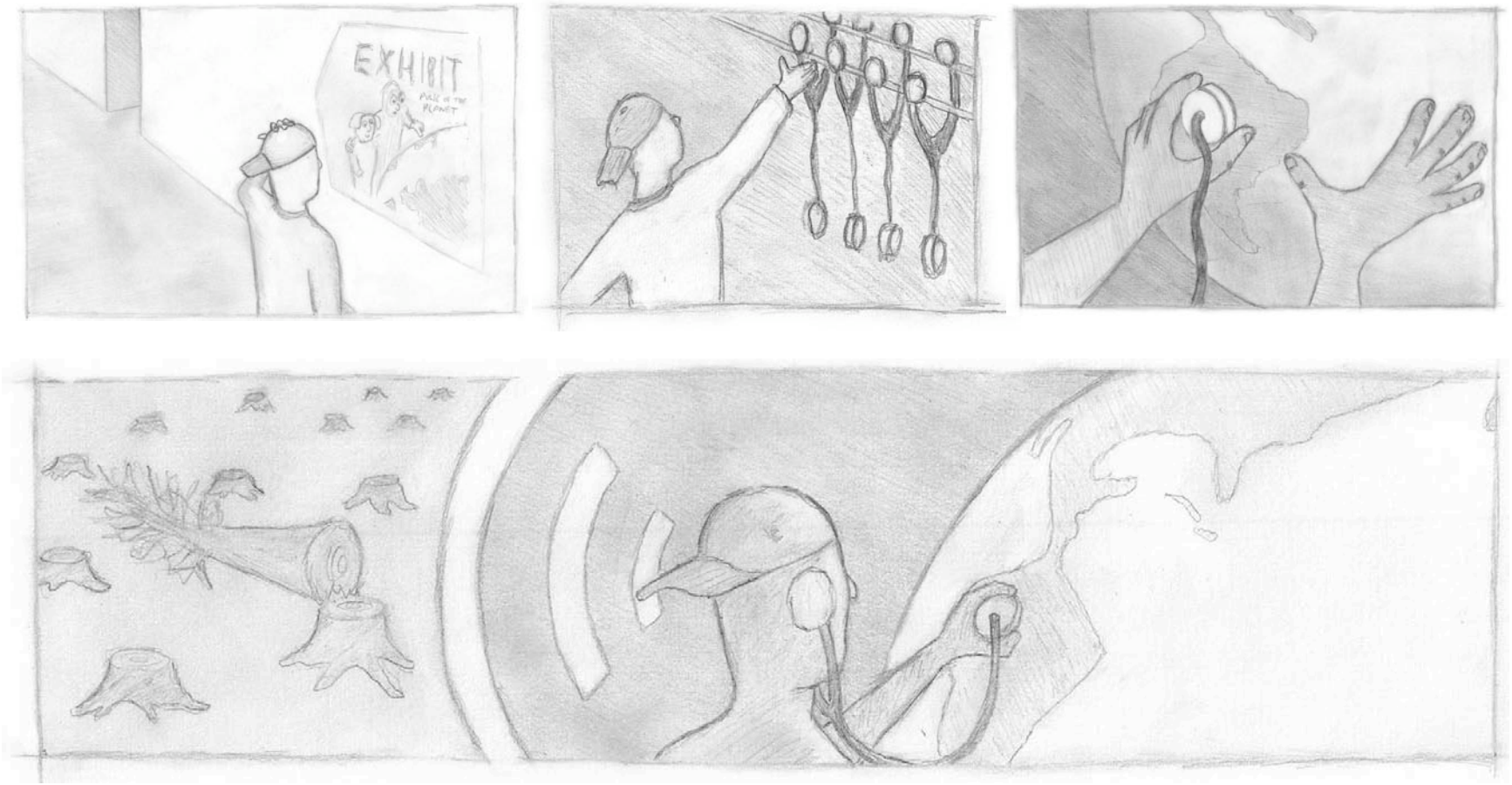
Background: Dartmouth College

Citation for Excellence, Dartmouth College

Official Selections:

- **Ann Arbor Film Festival, USA**
- **Auburn International Film Festival, Australia**
- **PISAF Animation Festival, Korea**

Background: Dartmouth College



Major Angst!

Engineering?

English?

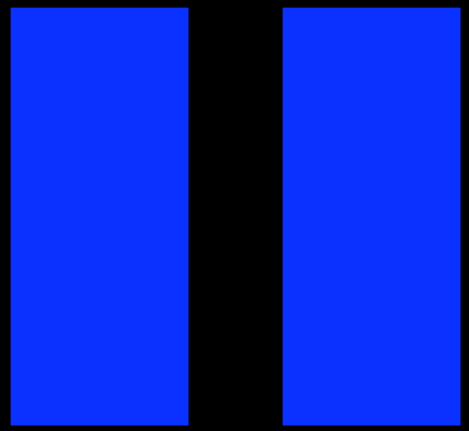
Psychology?

Studio Art?

Education?

Computer Science?

Major Angst!



Major Angst!

Certificate of TEFL Completion

New World Teachers

605 Market Street San Francisco

Krispin Leydon

Has successfully completed the I.T.E.L.F - Intensive Teaching English as Foreign Language

Evaluator

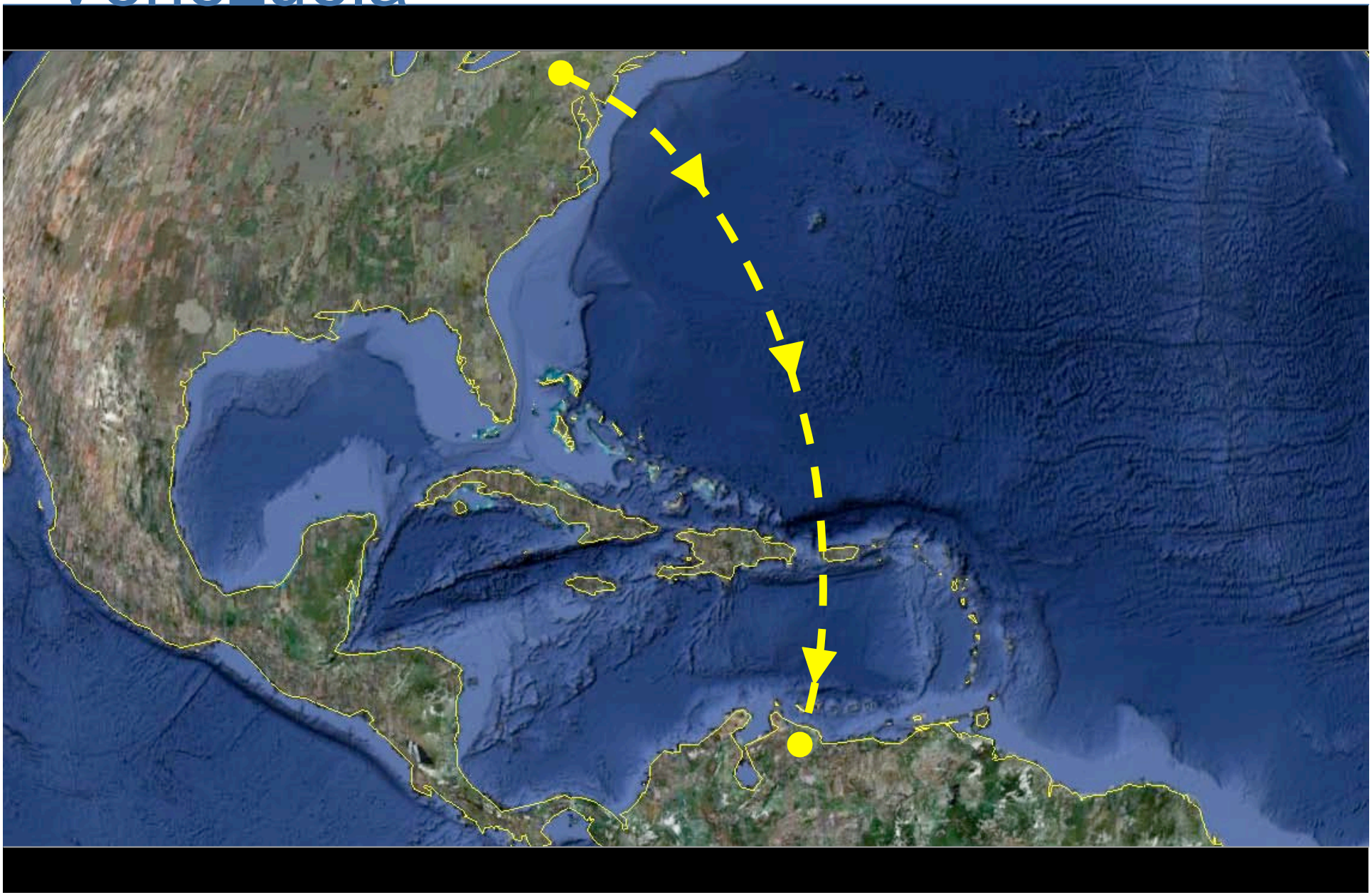
President, BESI LLC

BESI USA

Pass With Distinction

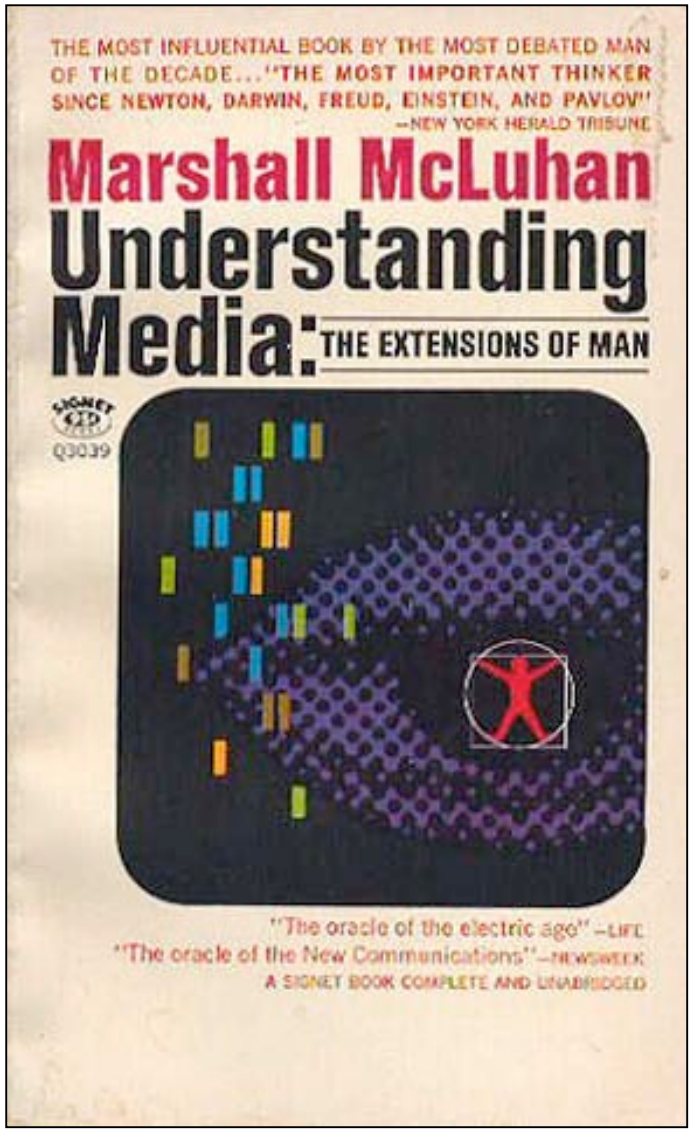
100001556

Venezuela

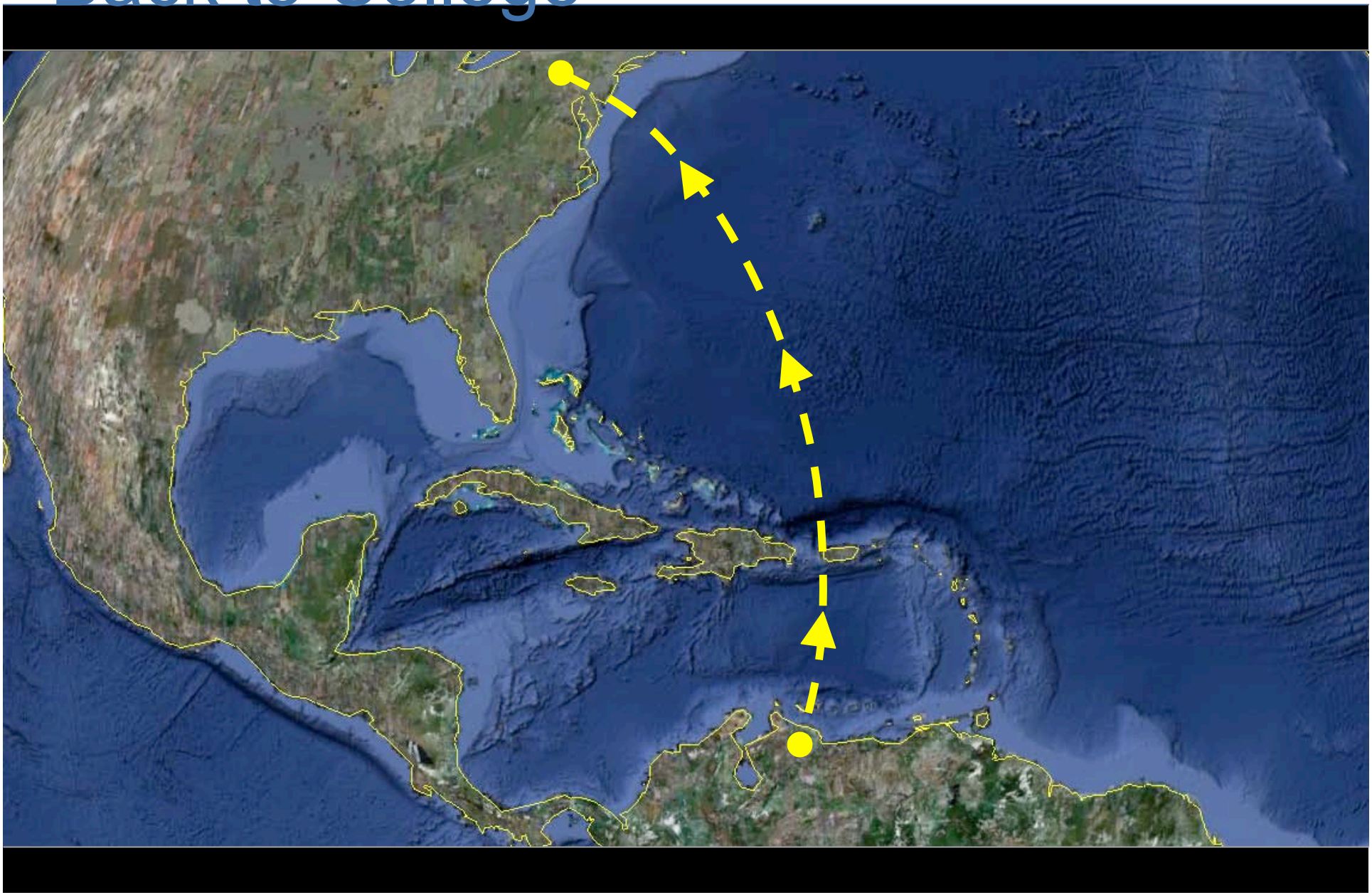


Teaching English

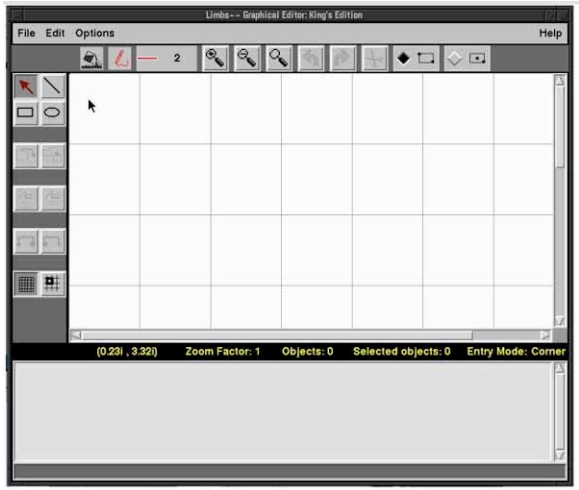
Reading & Reflection

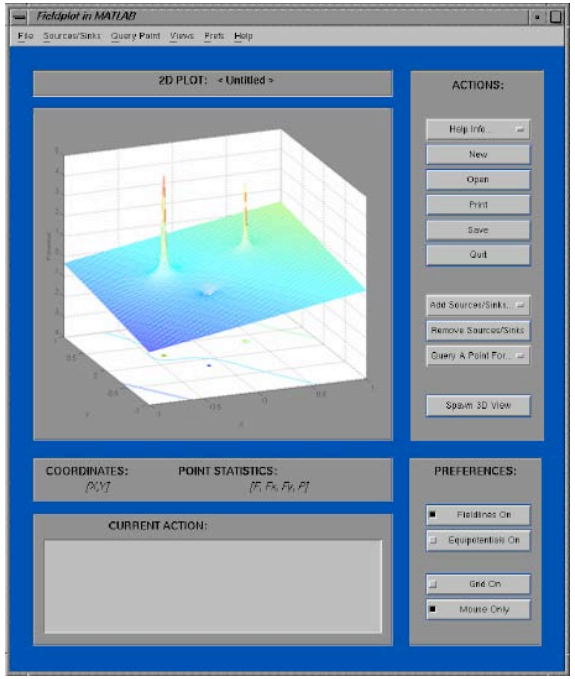


Back to College



UI Focus

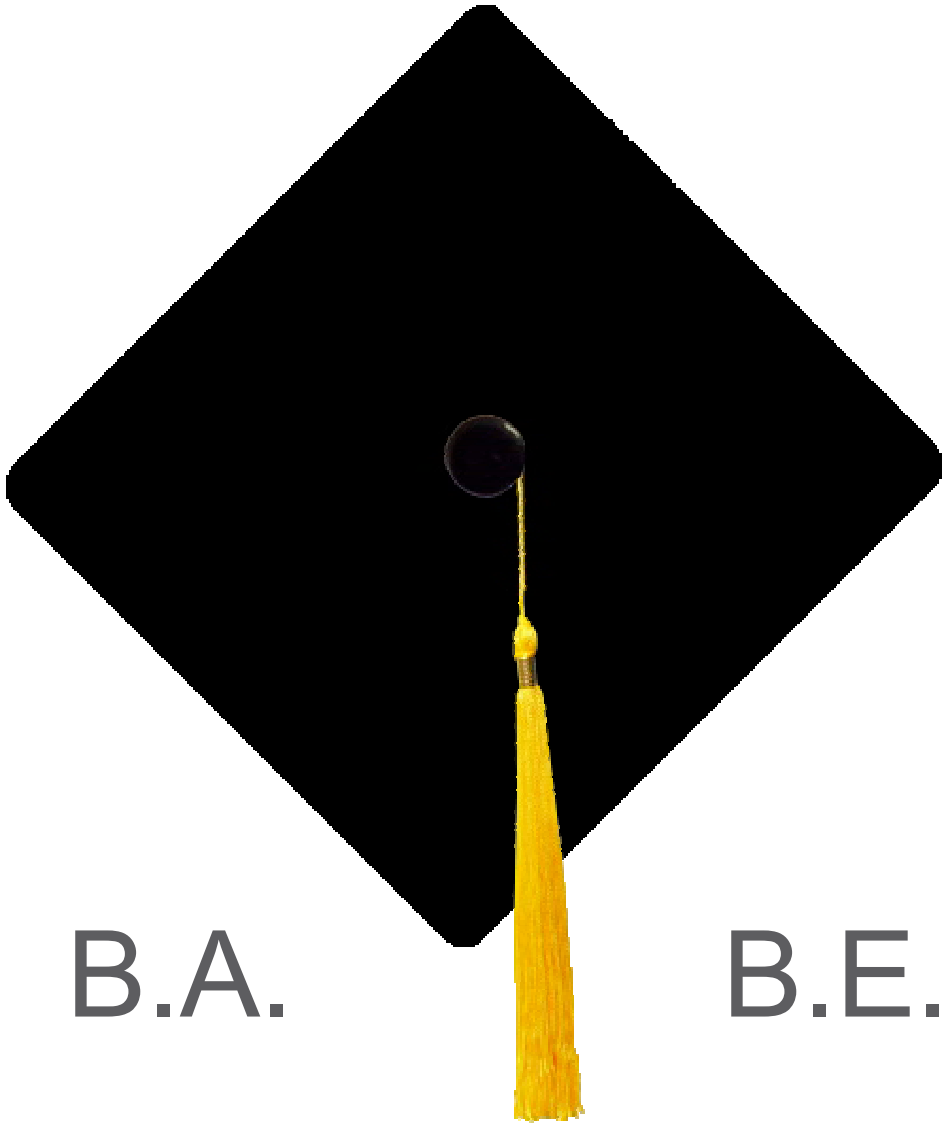

Limbs-- Graphical Editor; King's Edition
File Edit Options Help
(0.23i , 3.32i) Zoom Factor: 1 Objects: 0 Selected objects: 0 Entry Mode: Corner


Fieldplot in MATLAB
2D PLOT: < Untitled >
ACTIONS:
Help Info...
New
Open
Print
Save
Quit
Add Sources/Sinks...
Remove Sources/Sinks
Query A Point For...
Spawn 3D View
COORDINATES:
POINT STATISTICS:
PREFERENCES:
CURRENT ACTION:
Fieldlines On
Equipotentials On
Grid On
Mouse Only


Film Studies 35
file:///Users/krispin/Desktop/Krispins%20
Google
Film Studies 35
Animation at Dartmouth College
Click here for the CCB Sound and Animation website
COURSE INFO COURSE BACKGROUND STUDENT FILMS AWARDS COURSE INSTRUCTOR
Awards and Recognition
Click on titles to see Quicktime versions.
2000 - 2001
April Showers
by Corrie Francis, '01
(2000:5min)
Official Selection, PISAF Animation Festival, Puchon,Korea
Official Selection, Auburn International Film Festival, Australia
2nd Prize, Student Animation, ASIFA-East Animation Festival, New York
Echo Chamber
by Brent Knopf, '00
(2000:2min)
Official Selection, PISAF Animation Festival, Puchon, Korea
Official Selection, Auburn International Film Festival, Australia


TAedge
TAedge Vendor Access
Back to TAedge SuperChannel
View and Edit your Promotions
Promotions 1 - 10 of 44
Promotion
View
Edit
Expire
Delete
Views

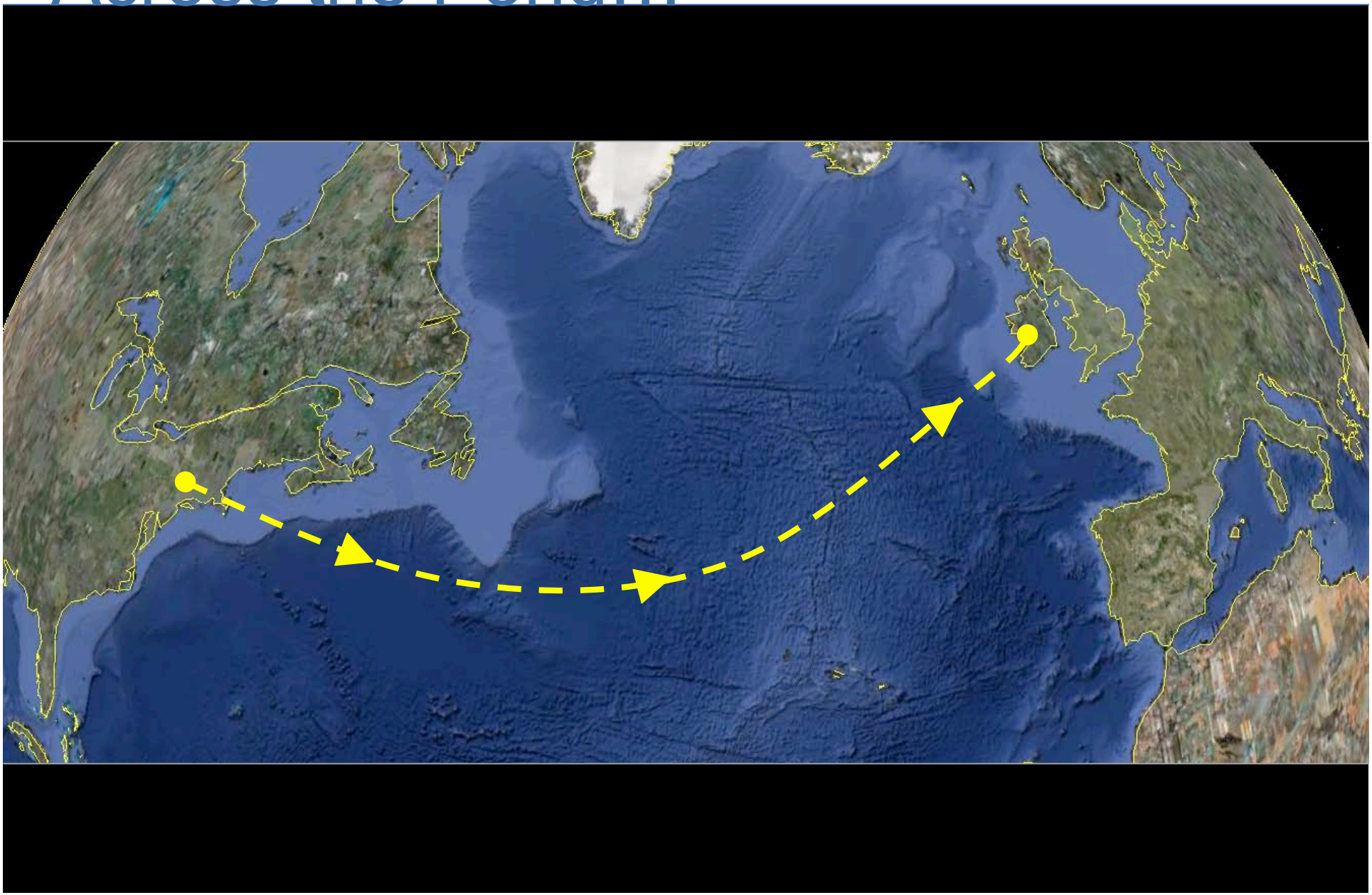
Graduation!



B.A. B.E.

Dot Com Crash!

Across the Pond…



Interaction Design Center

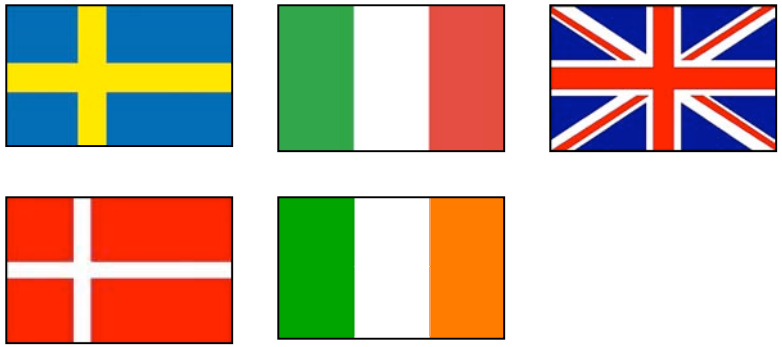
O_2 National Media Design Awards Nominee, 2003

Interaction Designers
Computer Scientists
Anthropologists
Psychologists

interaction
design
centre

Interaction Design Center

O_2 National Media Design Awards Nominee, 2003



interaction
design
centre

Different Perspectives

Dartmouth

interaction
design
centre

Individual

Desktop

Practical

Different Perspectives

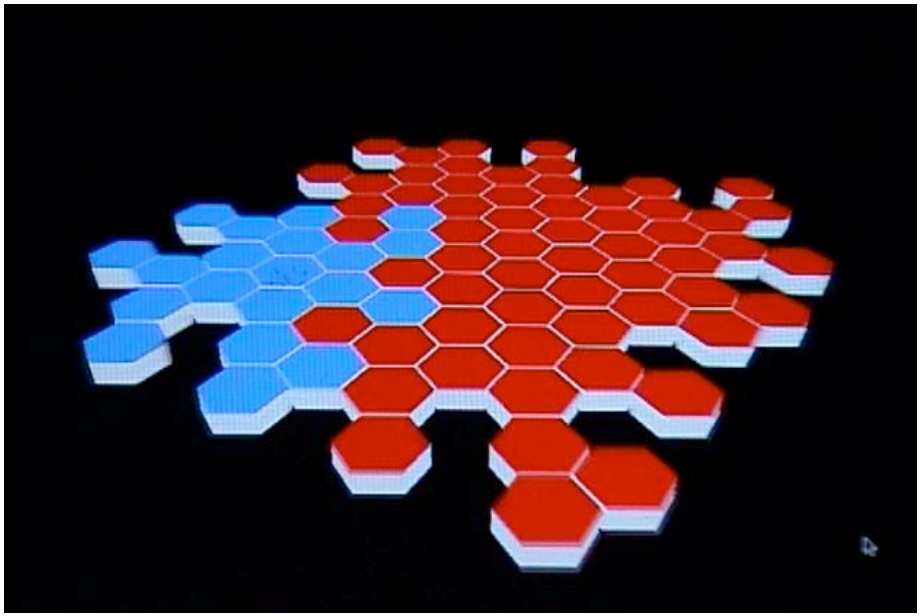
Dartmouth

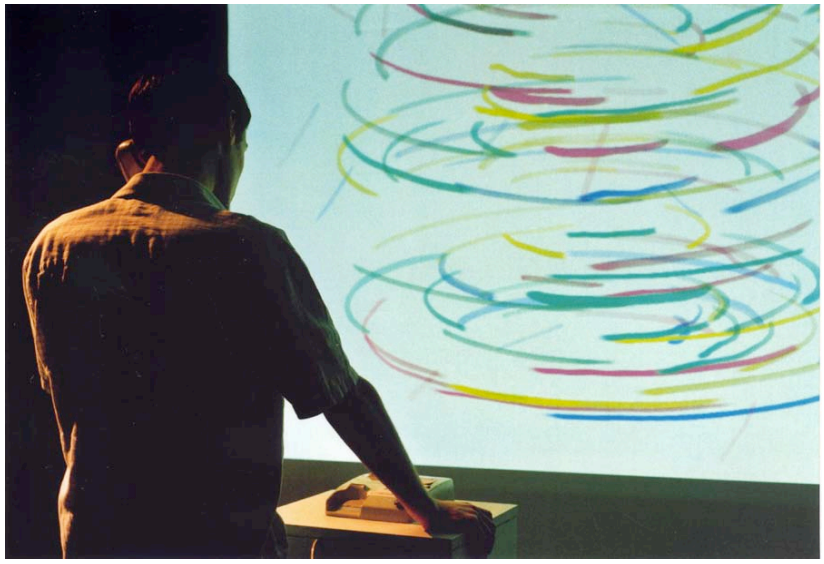
interaction
design
centre

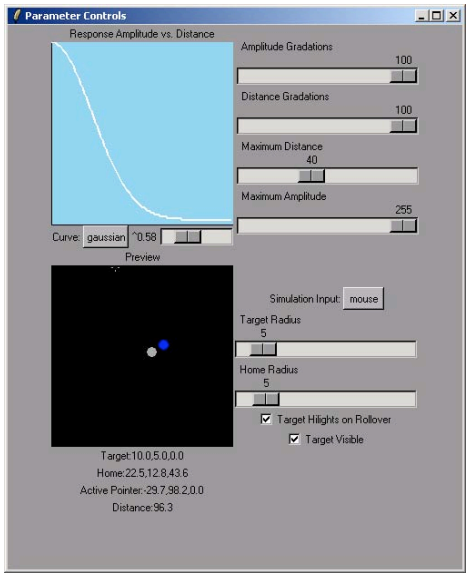
Individual	Social
Desktop	Mobile
Practical	Theoretical

Projects


Interaction Design Centre People - Netscape
search
go
interaction
design
centre
people
projects
news
publications
contact
marilyn lennon
research officer
After spending ten years working as an artists and in clay, glass and bronze, Marilyn began to explore the possibilities of new digital technology. She holds a MA in Ceramics and an MSc in Interactive Media, and is currently researching on the VisBreath project. In tandem with this, Marilyn's PhD research focuses on how to exploit the competencies, sensitivities and expertise available in the craft, art and design traditions, to enhance the quality of pervasive digital artefacts, particularly with regard to materiality.
Email: marilyn.lennon
Homepage: http://richie.idc.ul.ie/marilyn/index.htm
© IDC 2003

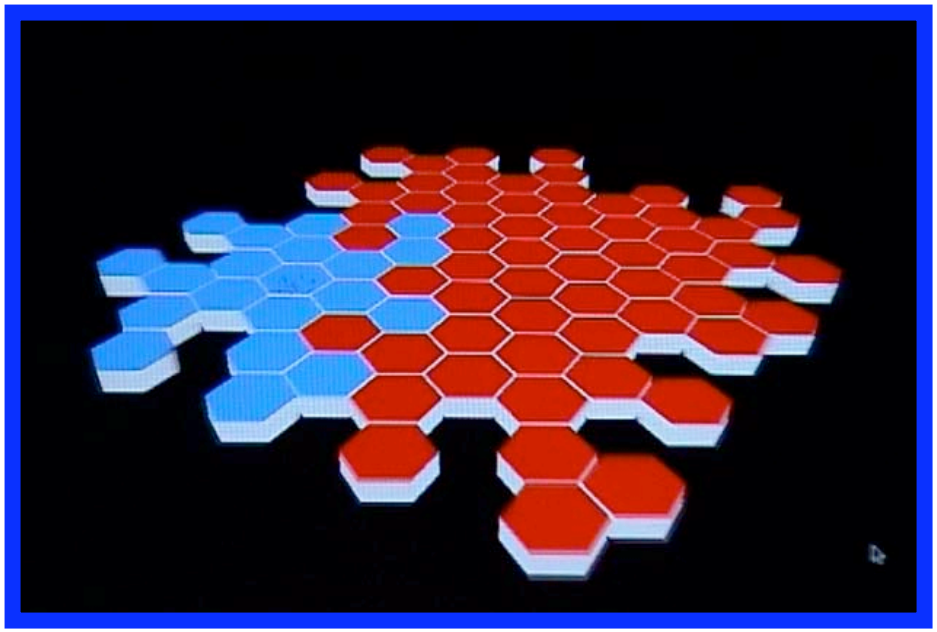


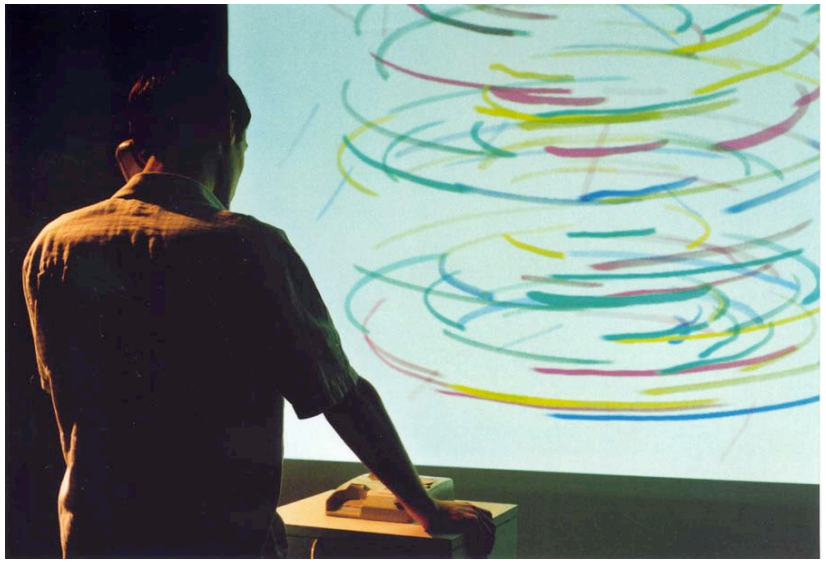


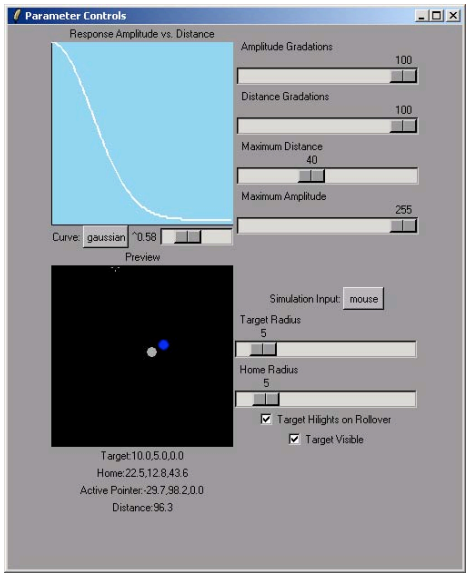

Parameter Controls
Response Amplitude vs. Distance
Amplitude Gradations
100
Distance Gradations
100
Maximum Distance
40
Maximum Amplitude
255
Curve: gaussian ^0.58
Preview
Simulation Input: mouse
Target Radius
5
Home Radius
5
Target Hilights on Rollover
Target Visible
Target:10.0,5.0,0.0
Home:22.5,12.8,43.6
Active Pointer:-29.7,98.2,0.0
Distance:96.3

Projects


Interaction Design Centre People - Netscape
interaction
design
centre
search
go
people
projects
news
publications
contact
marilyn lennon
research officer
After spending ten years working as an artists and in clay, glass and bronze, Marilyn began to explore the possibilities of new digital technology. She holds a MA in Ceramics and an MSc in Interactive Media, and is currently researching on the VisBreath project. In tandem with this, Marilyn's PhD research focuses on how to exploit the competencies, sensitivities and expertise available in the craft, art and design traditions, to enhance the quality of pervasive digital artefacts, particularly with regard to materiality.
Email: marilyn.lennon
Homepage: http://richie.idc.ul.ie/marilyn/index.htm
© IDC 2003

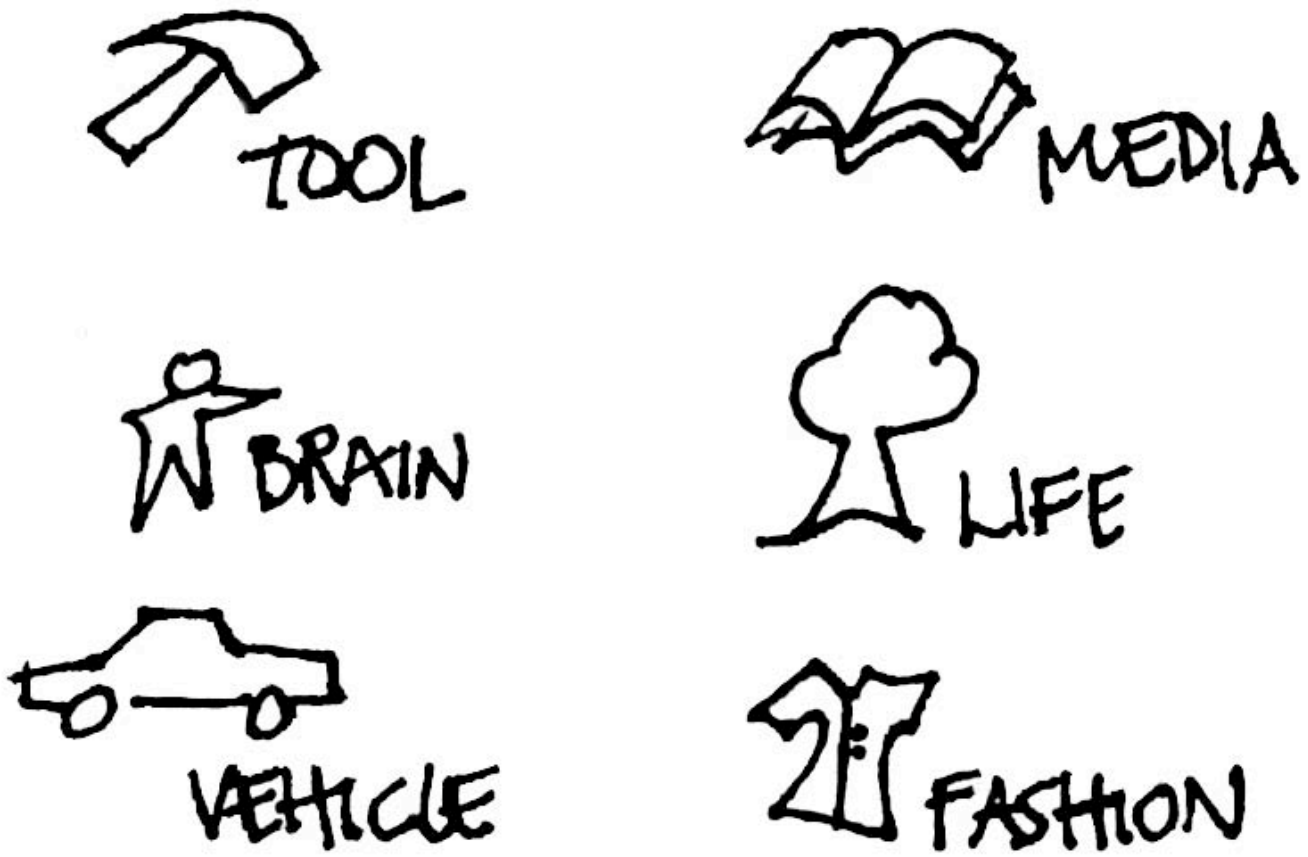





Parameter Controls
Response Amplitude vs. Distance
Amplitude Gradations
100
Distance Gradations
100
Maximum Distance
40
Maximum Amplitude
255
Curve: gaussian ^0.58
Preview
Simulation Input: mouse
Target Radius
5
Home Radius
5
Target Hilights on Rollover
Target Visible
Target:10.0,5.0,0.0
Home:22.5,12.8,43.6
Active Pointer:-29.7,98.2,0.0
Distance:96.3

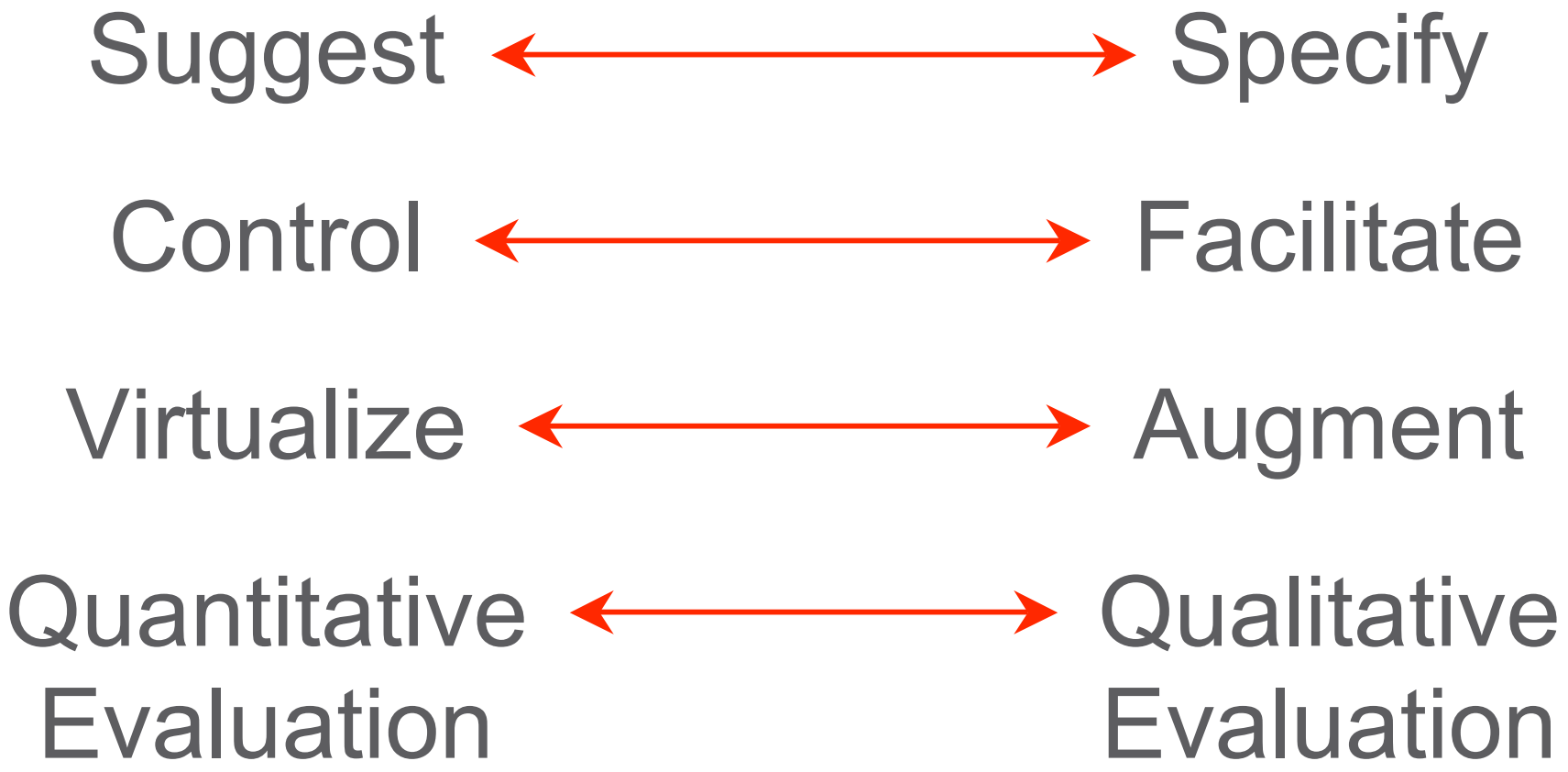
Projects

Paradigms



Sketches: Bill Verplank

Tensions

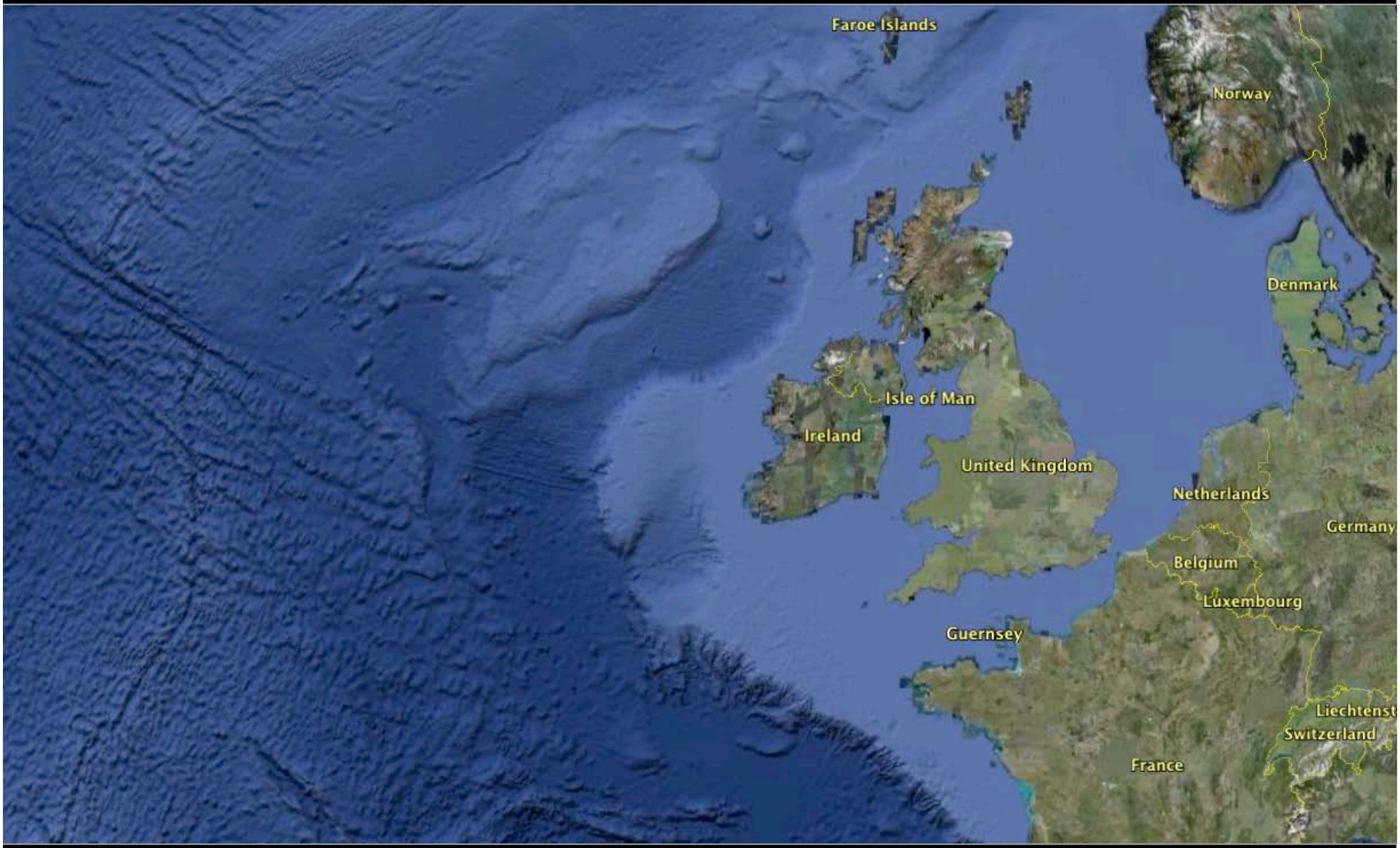

Suggest
Specify
Control
Facilitate
Virtualize
Augment
Quantitative Evaluation
Qualitative Evaluation

Masters

UNIVERSITY *of* LIMERICK
OLLSCOIL LUIMNIGH

Media Lab Europe
European Research Partner
of MIT Media Lab

An Off-Shore Island



Center of the Action

Xerox PARC

Interval Research

Stanford

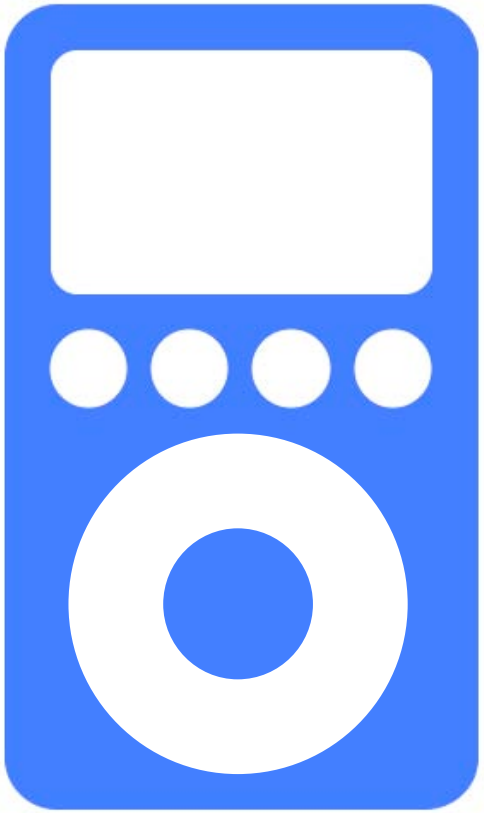
IDEO

Google

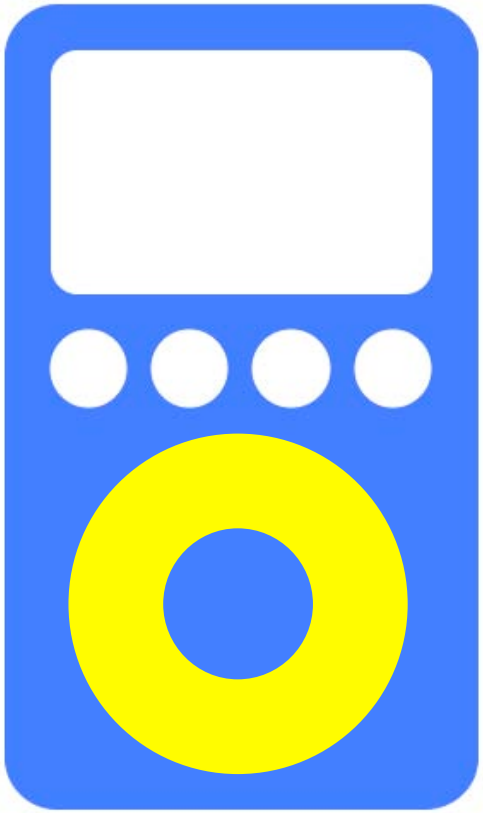
Back Across the Pond

West!

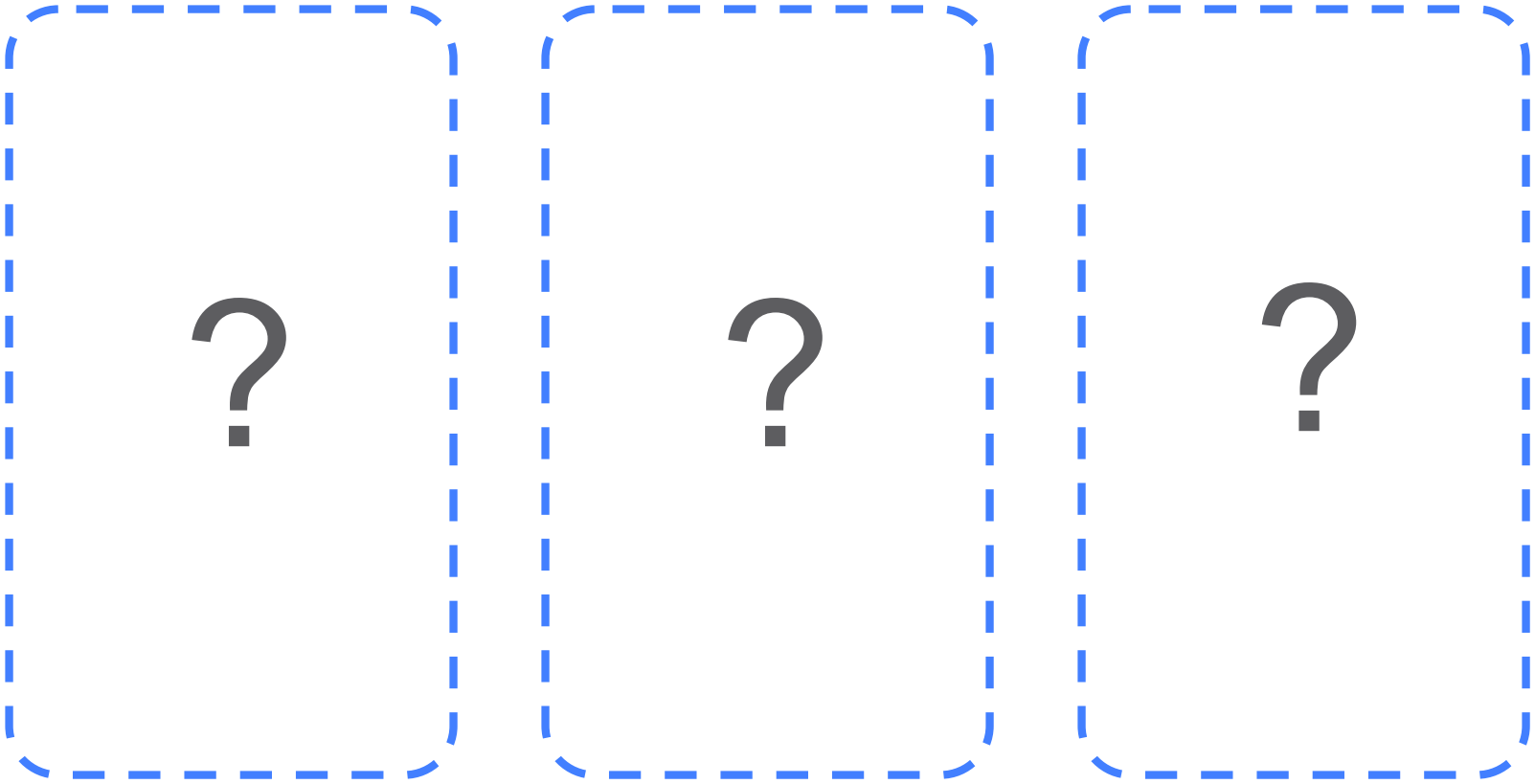
Synaptics



Synaptics



Synaptics



Synaptics

Synaptics

Mobile Music

Console Gaming

Living Room TV & PC Use

Tesla

TESLA MOTORS

Craft

Engineering

Animation

Teaching English

Interaction Design

Craft

Engineering

Animation

Teaching English

Interaction Design

Craft

Engineering

Animation

Teaching English

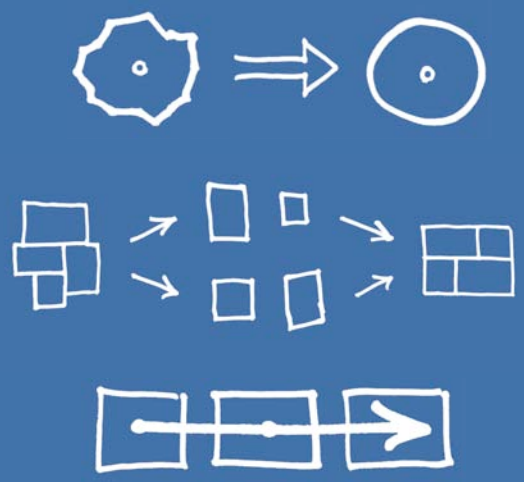
Interaction Design

Craft

Engineering

Animation

Teaching English



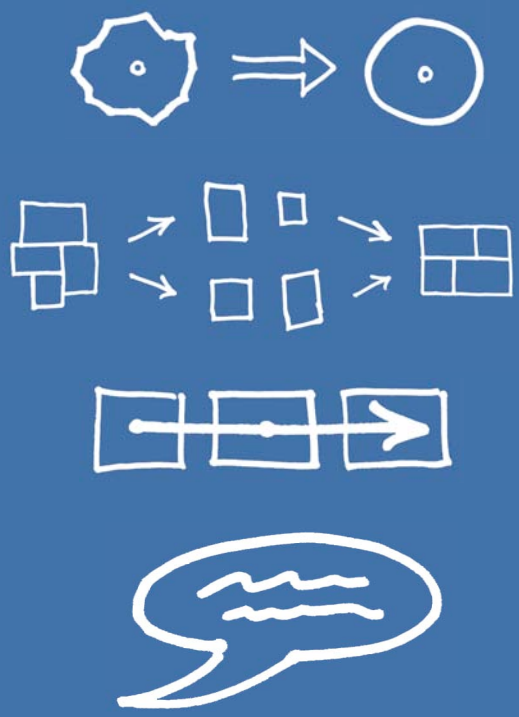
Interaction Design

Craft

Engineering

Animation

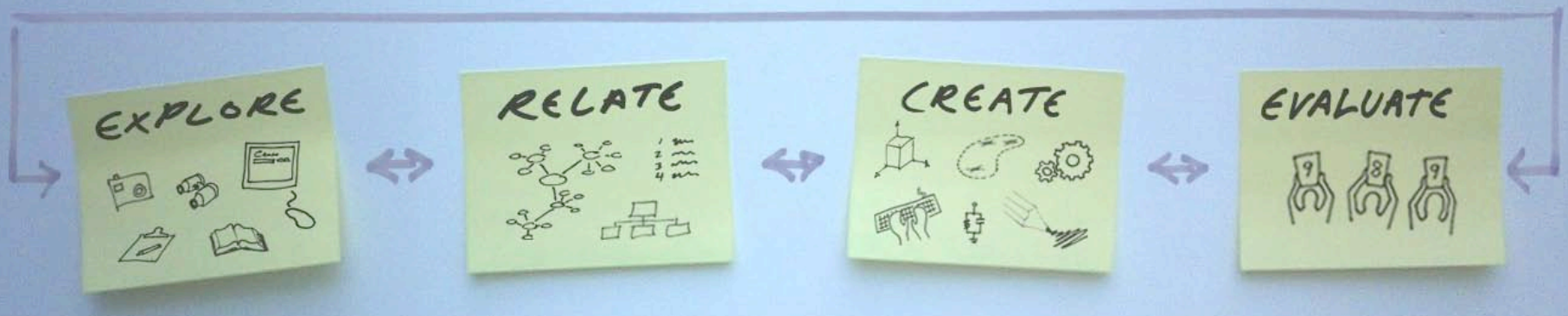
Teaching English



Interaction Design

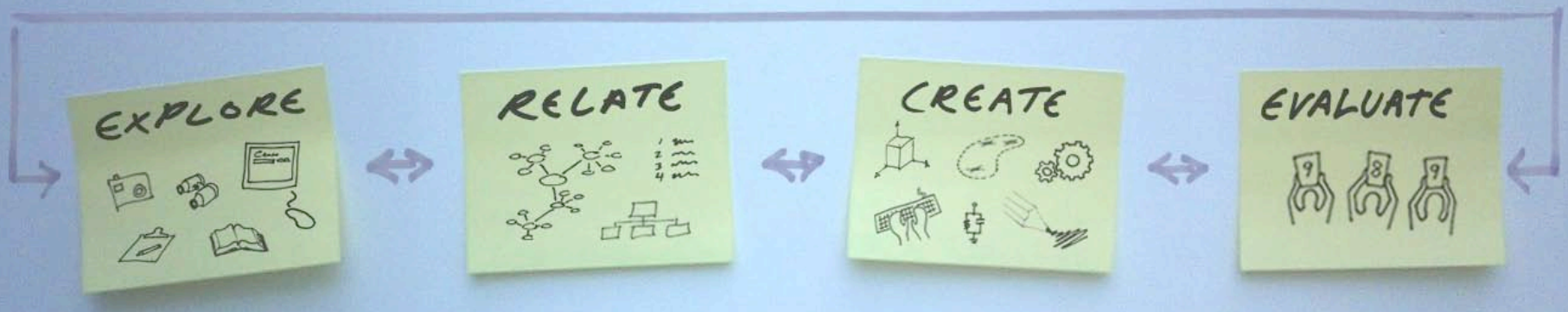
Process

Process



Iterative
Collaborative
User Centered
Pragmatic, not Dogmatic

Process



User Research: observational studies / interviews / surveys / diary studies / task analysis / shadowing / rapid ethnography / mind mapping / focus groups / think aloud studies / time and motion studies / place studies / lifestyle studies / design probes / wear pattern examination

Resources Research: literature reviews / patent searches / trend tracking / market research / stockroom browsing / web searches / catalog browsing / code, material and part samples

Ideation: brainstorming / role play / sketching / scavenging / listing / linguistic linking / complaint collation / affinity diagrams / map making /

Distillation: priority lists / decision matrices / decision trees / user and developer critiques / life raft game / key perspectives /

Definition: problem statement / personas and goals / scenarios

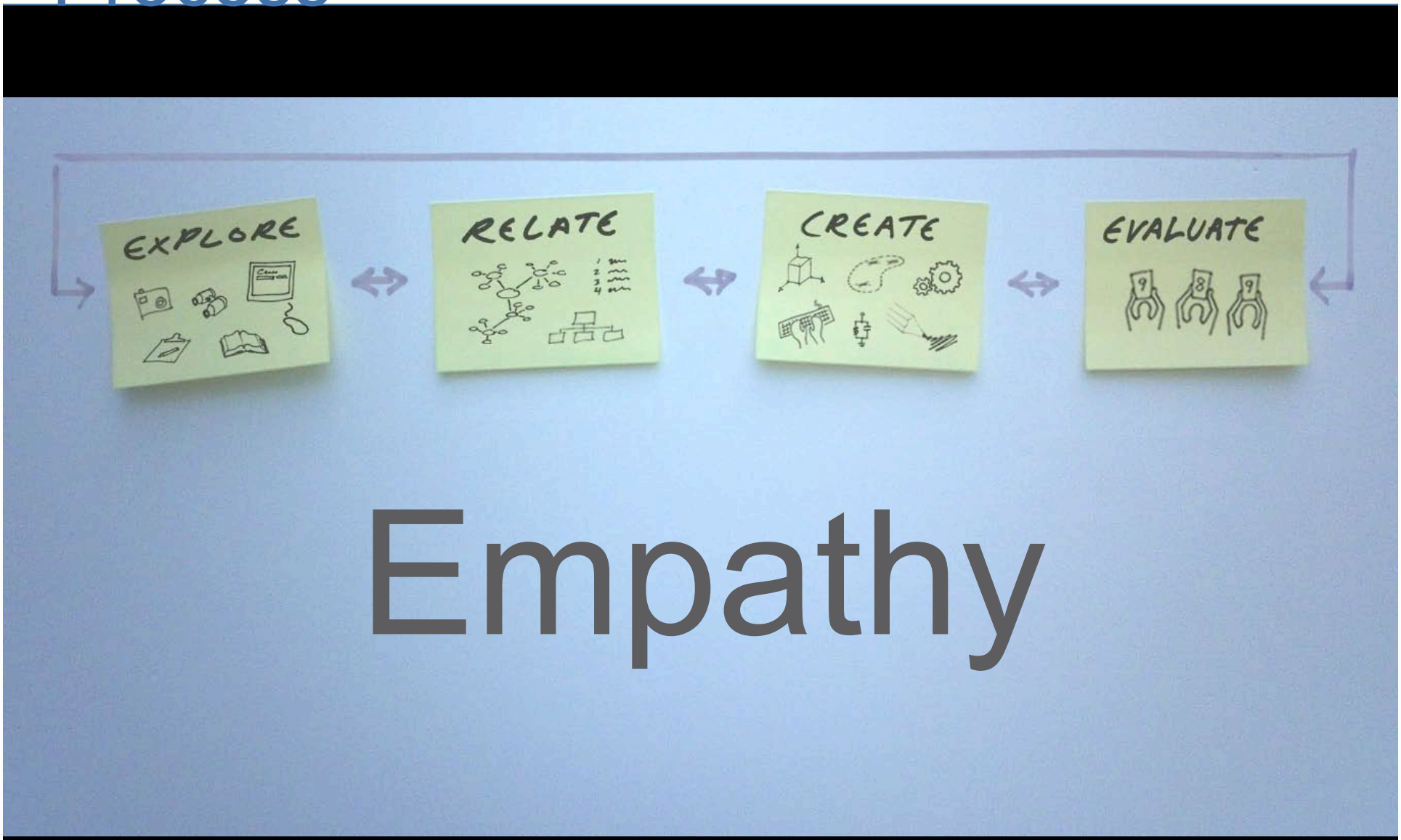
Interaction: choice of paradigm / conceptual modeling / metaphor selection / storyboarding / video prototyping / key paths / flow charting / information architecture / navigation and transitions

Function: functional specification / flow charting / mechanical prototyping / bread-boarding / circuit CAD / software development / firmware development

Form: sketching / mockups / rapid prototyping / CAD-CAM / vacuum forming / injection molding / machining

benchmark testing / functional testing / expert review / lead user review / peer review / language consistency checks / narrative coherence checks / formal proofs / heuristic review / time and motion studies / interviews / field and laboratory studies / market watch / retrospective review

Process



Process

Google Design Challenge

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Choices…

- Google Cafés
- Job Application Tracker
- Real Time Gas Prices

Choices…

- Google Cafés
- Job Application Tracker
- Real Time Gas Prices

Choices…

- Google Cafés
- Job Application Tracker
- Real Time Gas Prices

Challenge

Design a Job Applicant Tracking System supporting these tasks:

For Recruiters:

• Search/Browse for applicant(s)

• View/Edit applicant-related info, move applicant(s) between stages in recruitment process:

- Resume Submitted
- Ok to Phone Screen
- Approved for In-Person
- Approved/Rejected
- Accepted/Declined

Challenge

Design a Job Applicant Tracking System supporting these tasks:

For Employee Interviewers:

- View list of applicants to be interviewed, view applicant details
- Submit interview notes to HR, receive reminders if necessary

Given three months, describe your process and schedule

Produce a low-fi overview, and one high-fi interaction detail.

Schedule

Week 1-2: Background Research

Engage stakeholders for a nuanced understanding of needs.
Examine existing system to be replaced/complemented.
Identify “lead users”, for future feedback.

Week 2-3: Paper Prototyping / Screen Mock-Ups

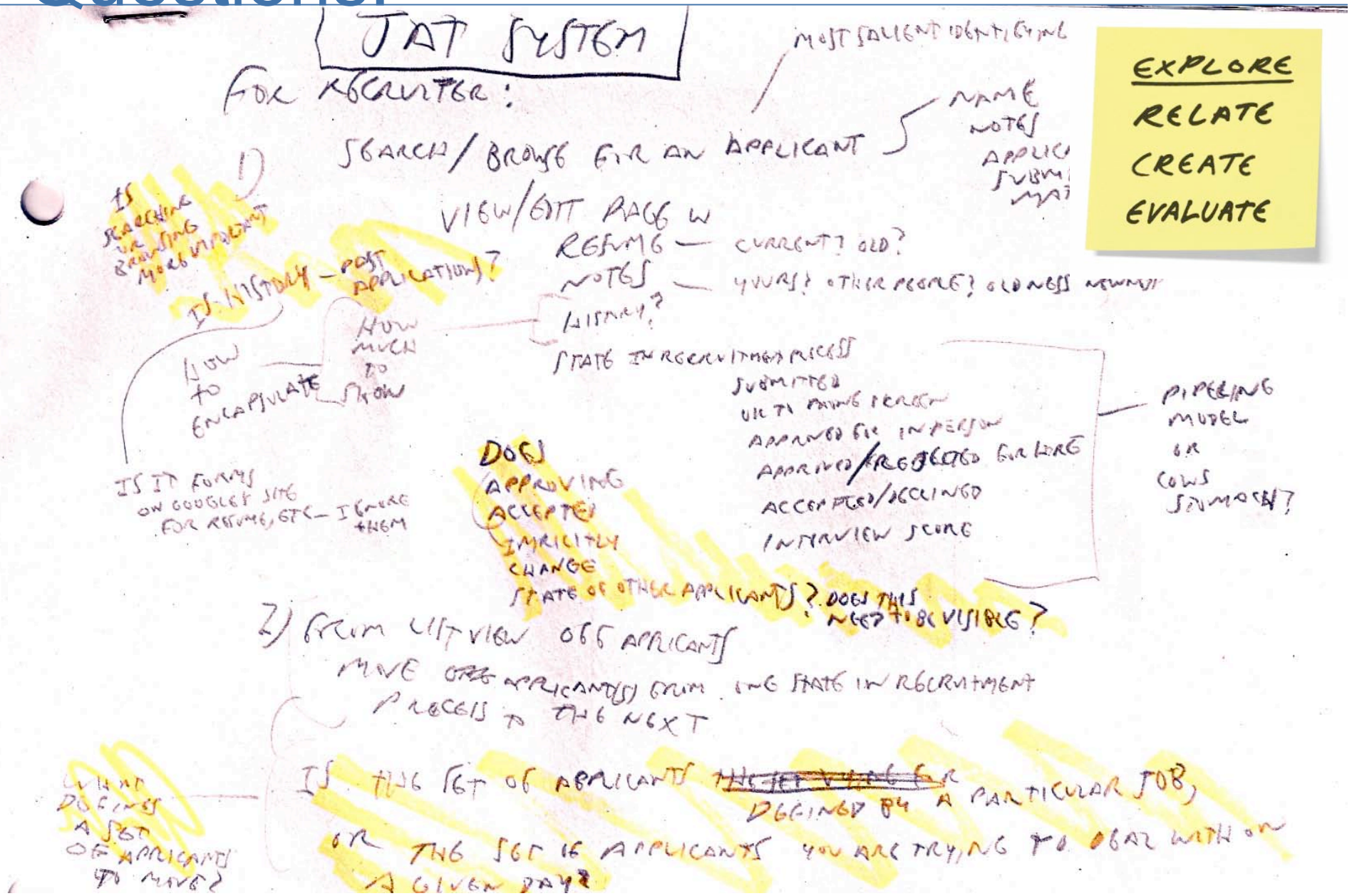
Quickly and iteratively test variations, with feedback.

Week 4: Formally present design to developers, discuss implementation and timeframe concerns. Revise, reorganize, plan.

Week 5-10: Work with developers; tighten specs, provide graphical assets, function as a user advocate. Plan usability testing.

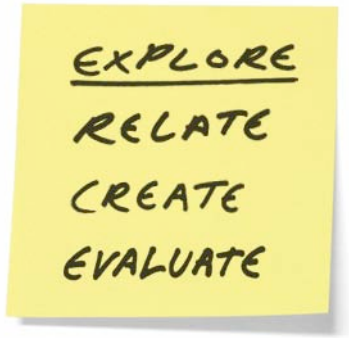
Week 10-12: Usability & Functional Testing, Tweaking.

Questions!

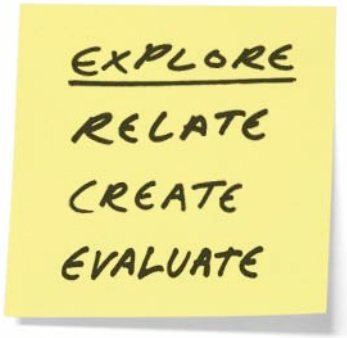

JAT SYSTEM
FOR RECRUITER:
SEARCH / BROWSE FOR AN APPLICANT
VIEW/EDIT PAGE W
RESUME — CURRENT? OLD?
NOTES — YOURS? OTHER PEOPLE?
HISTORY?
STATE IN RECRUITMENT PROCESS
SUBMITTED
UNDER PHONE SCREEN
APPROVED FOR INTERVIEW
APPROVED/REJECTED FOR HIRE
ACCEPTED/DECLINED
INTERVIEW SCORE
EXPLORE
RELATE
CREATE
EVALUATE
PIPELINING MODEL OR COWS STOMACH?
DOES APPROVING ACCEPTED IMPLICITLY CHANGE STATE OF OTHER APPLICANTS? DOES THIS NEED TO BE VISIBLE?
2) FROM LIST VIEW OF APPLICANTS
MOVE APPLICANT(S) FROM ONE STATE IN RECRUITMENT PROCESS TO THE NEXT
IS THE SET OF APPLICANTS DEFINED BY A PARTICULAR JOB,
OR THE SET IS APPLICANTS YOU ARE TRYING TO DEAL WITH ON A GIVEN DAY?
HOW MUCH TO SHOW
HOW TO ENCAPSULATE
IS IT FORMS ON GOOGLER SITE FOR RESUME, ETC — IGNORE THEM

For Recruiters…

- Pipeline or Cow's Digestive Tract?
- How do you remember/recall applicants?
- People/resources you depend/wait on?
- Hidden (implicit) stages in process?
- Value of side-by-side comparison?
- Are notes "communal"?

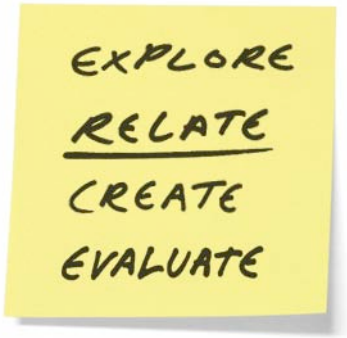


For Employee Interviewers…



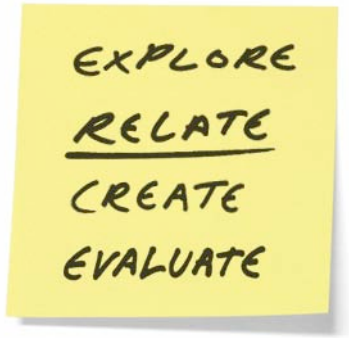
- What supplied resources do you review before/after/during interview?
- How do you prepare for writing feedback? Do you take notes? When? How?
- Rules? Forms?

Recruiter Perspective



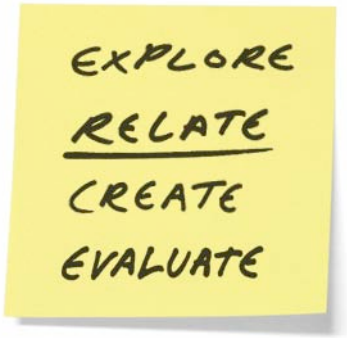
Recruiters want to move applicants through the process fluidly – and fairly – without getting “stuck”.

Recruiter Perspective



They *don't* want to have to remind employee interviewers to provide feedback.

Interviewer Perspective

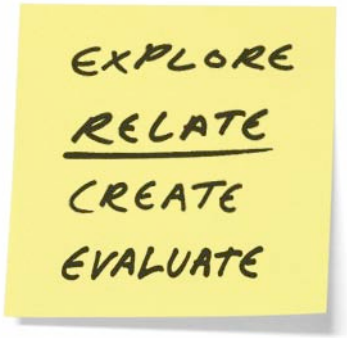


Employee interviewers enjoy talking with applicants, may not enjoy “administrative overhead” of interview process.

Interviewer Perspective

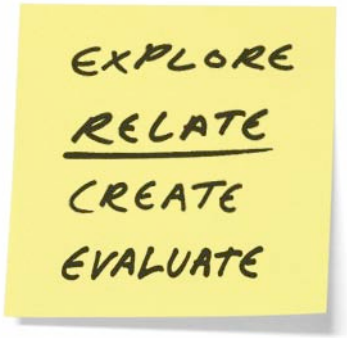
In balancing interviews with work deadlines, employees risk returning to partially completed write-ups wondering: “Where was I?”

Interviewer Perspective



Interviewers tend to take notes *during* interviews, and send feedback to HR soon after interviews when possible.

Interviewer Perspective



Interviewers access their schedule when *planning* and *preparing* an interview (more than while *interviewing*).

Recruiter Tasks

Find Applications
- Search for applications
- Shortcuts to recent searches

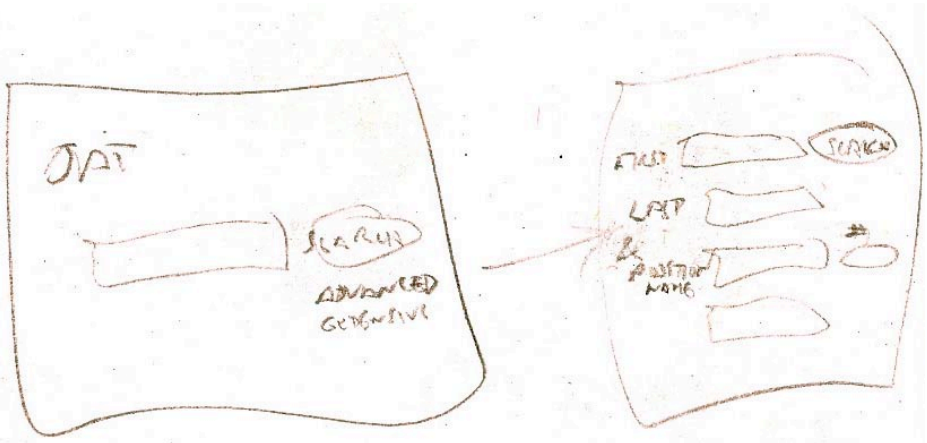
↓

Browse "Short List" of Applications
- Select an applicant
- Compare applicants (?)

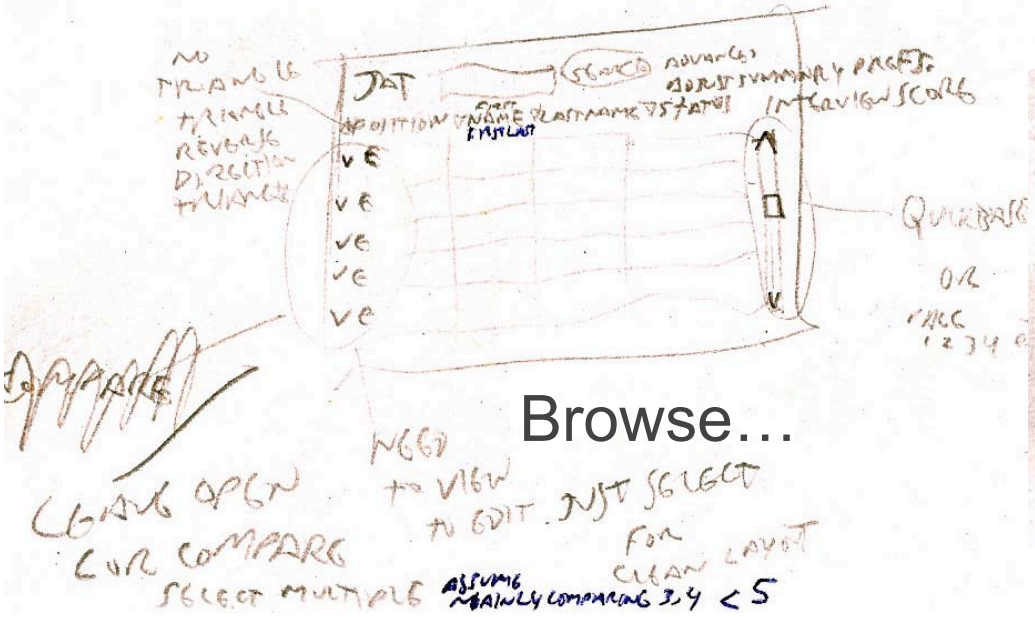
↓

View/Edit/Move an Application
- View Applicant's submitted materials
- Edit associated HR notes, etc.
- Move application to next stage

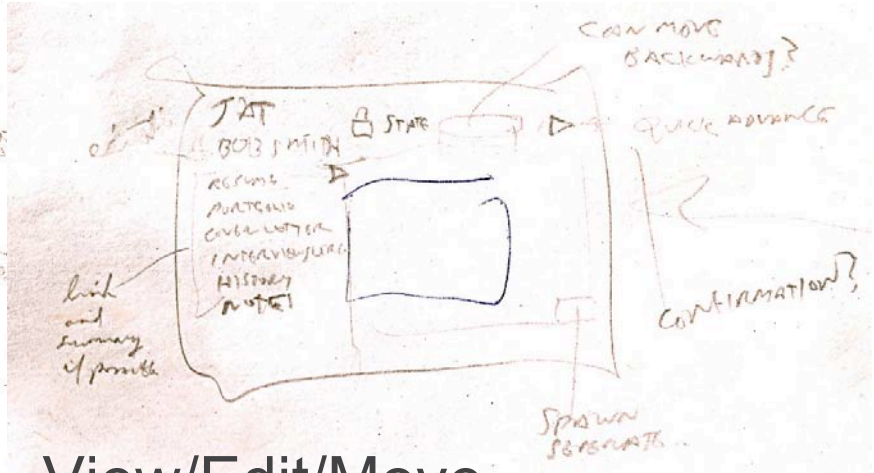
Recruiter-Side Sketches, V1



Find…



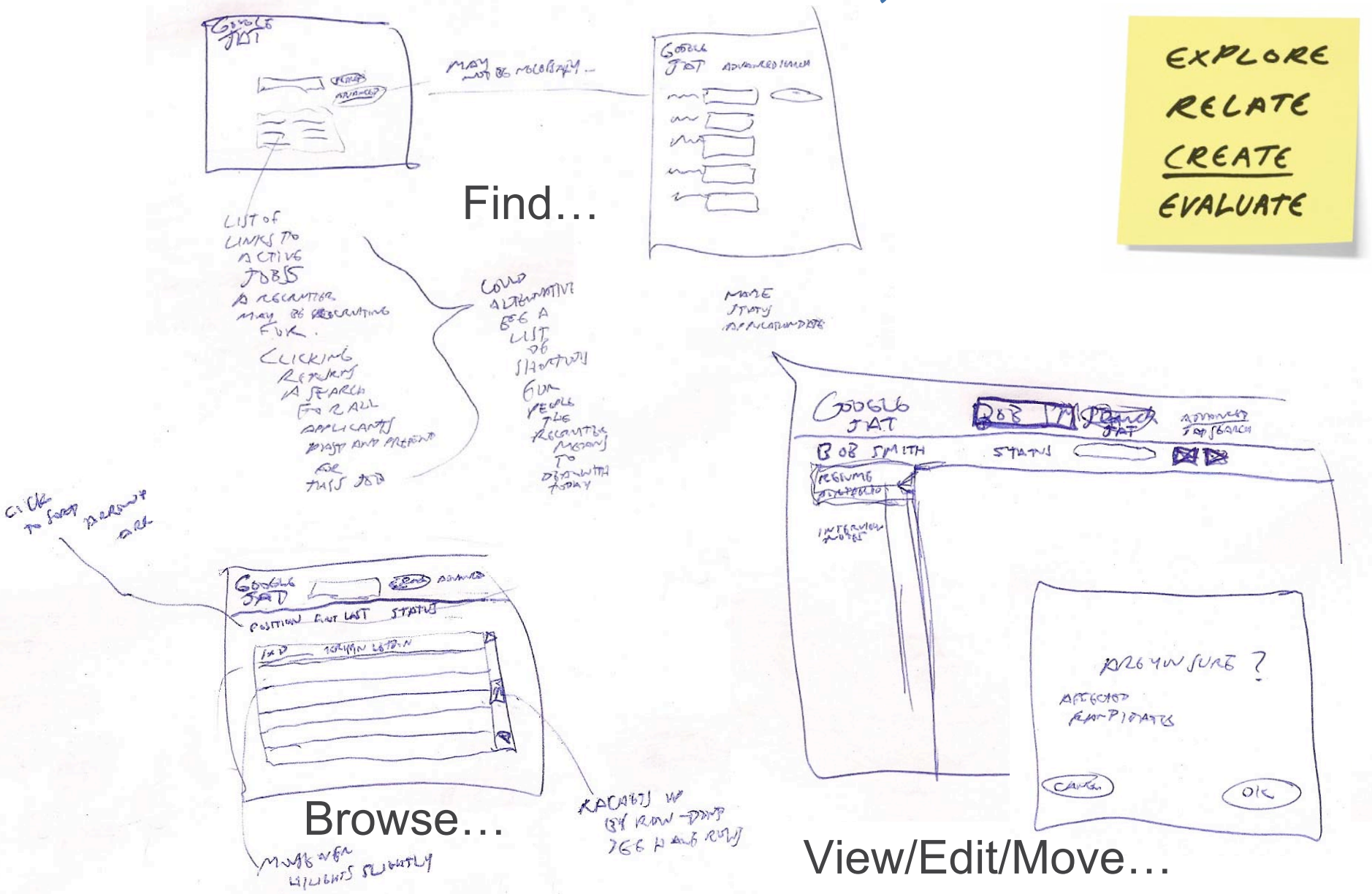
Browse…



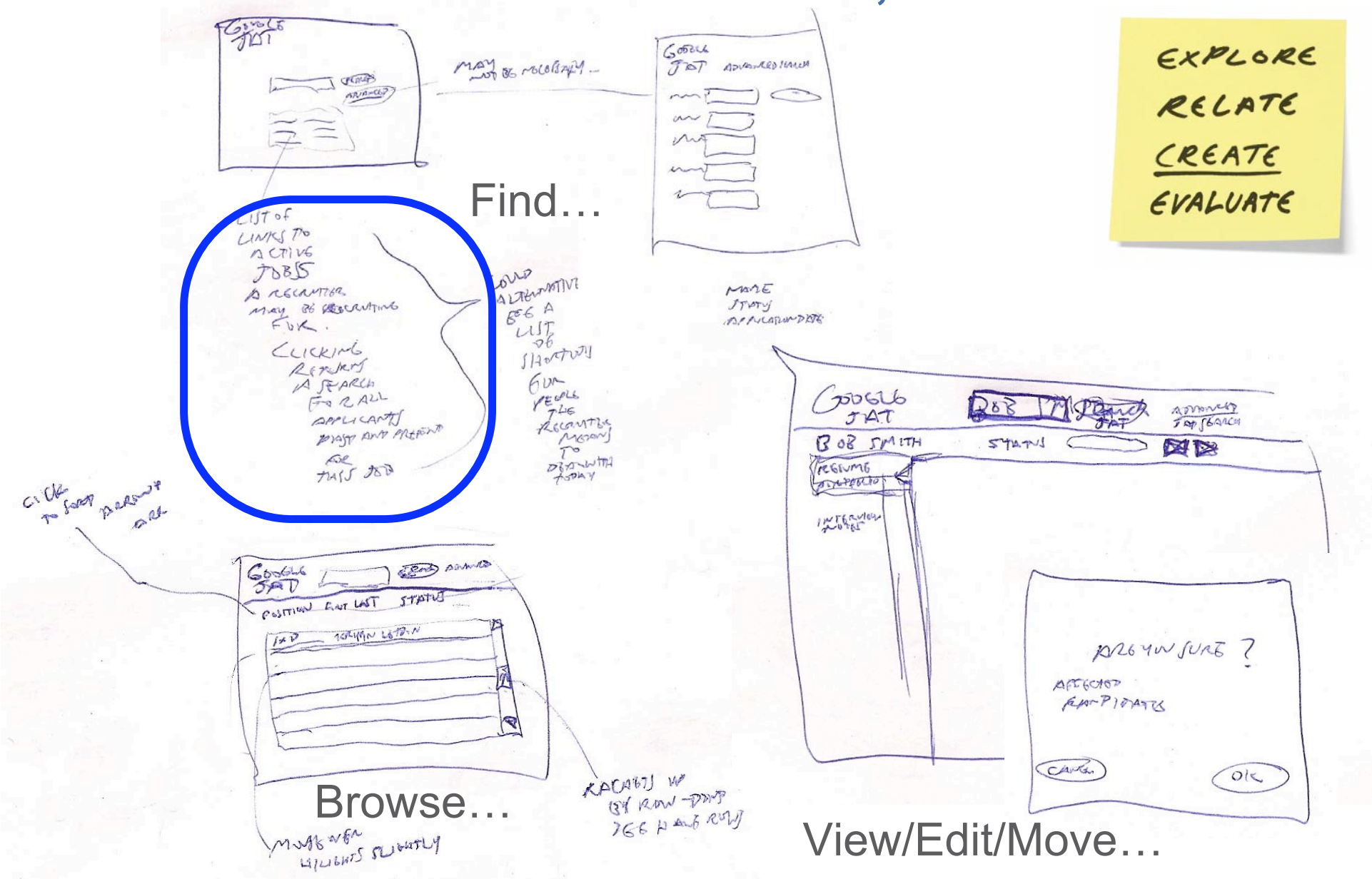
View/Edit/Move…

EXPLORE
RELATE
CREATE
EVALUATE

Recruiter-Side Sketches, V2



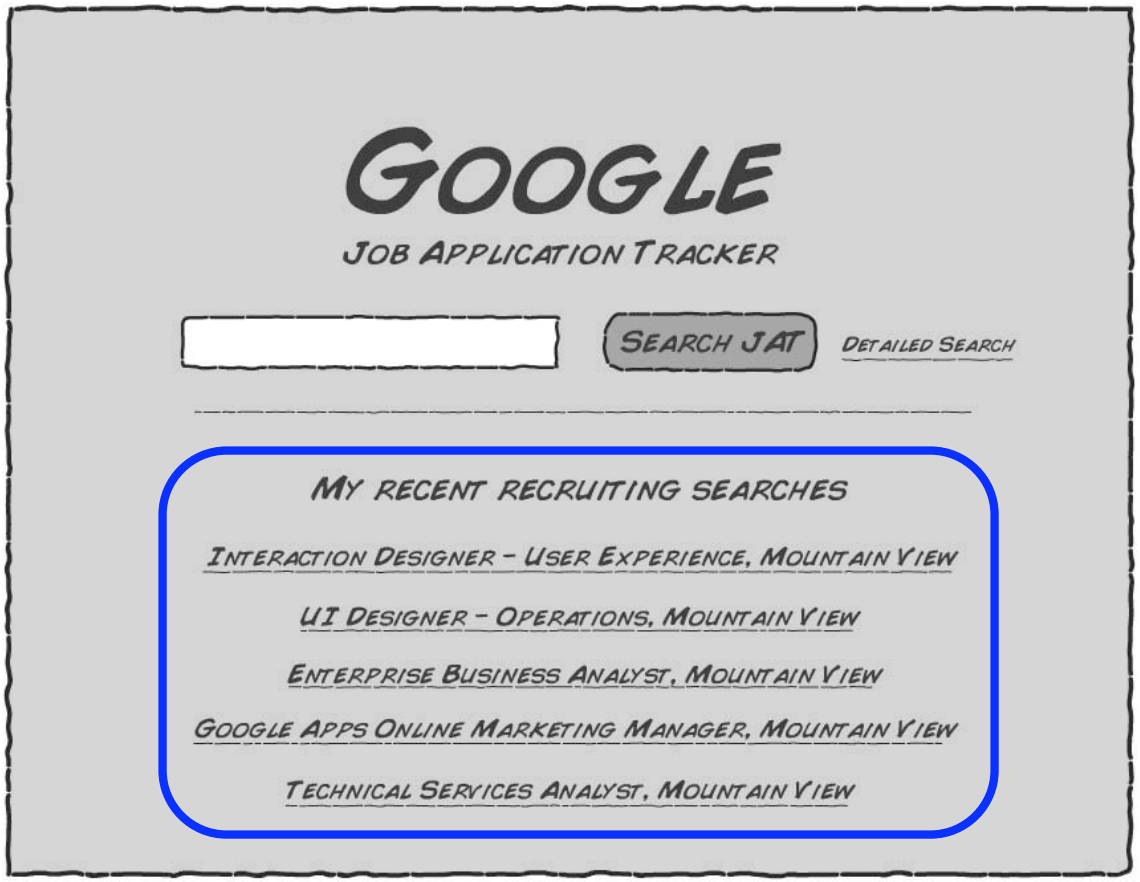
Recruiter-Side Sketches, V2



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

Find



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

Find

Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

Find

Recruiter-Side Sketches, V3

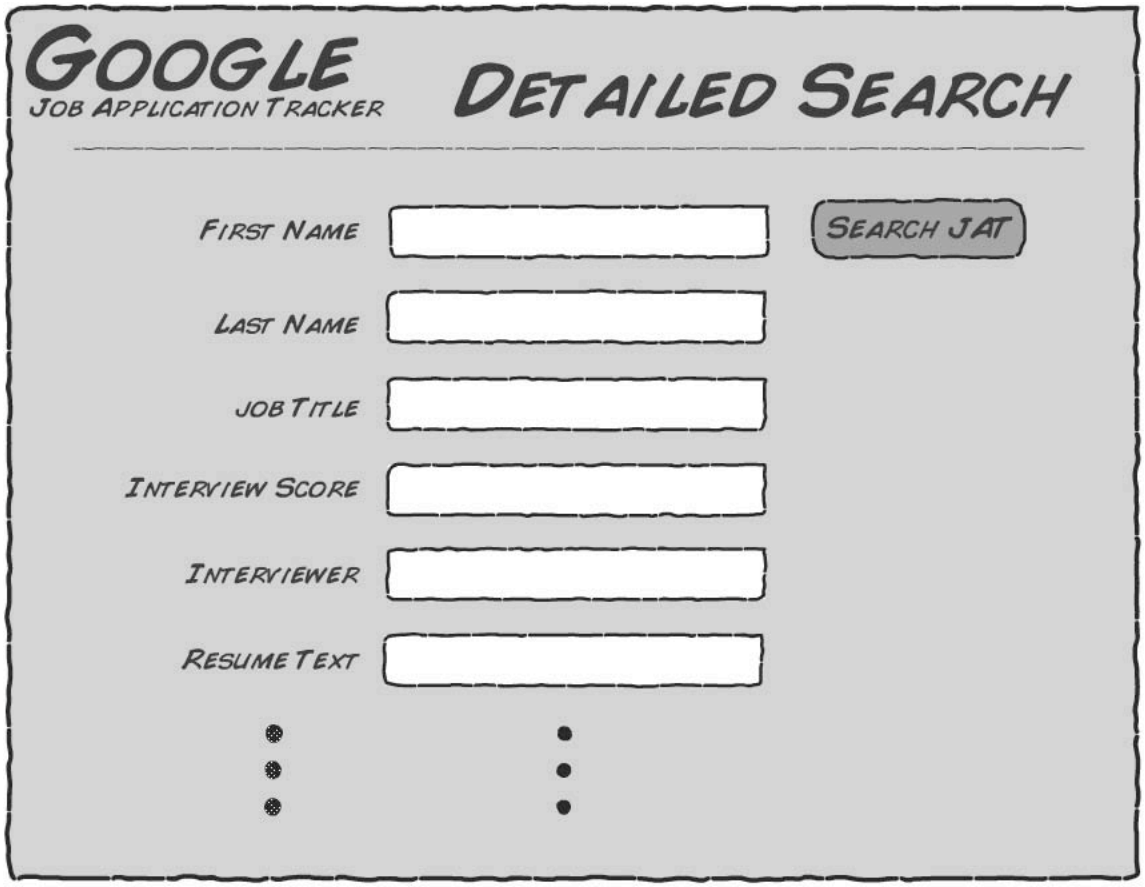
EXPLORE
RELATE
CREATE
EVALUATE

Find

Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

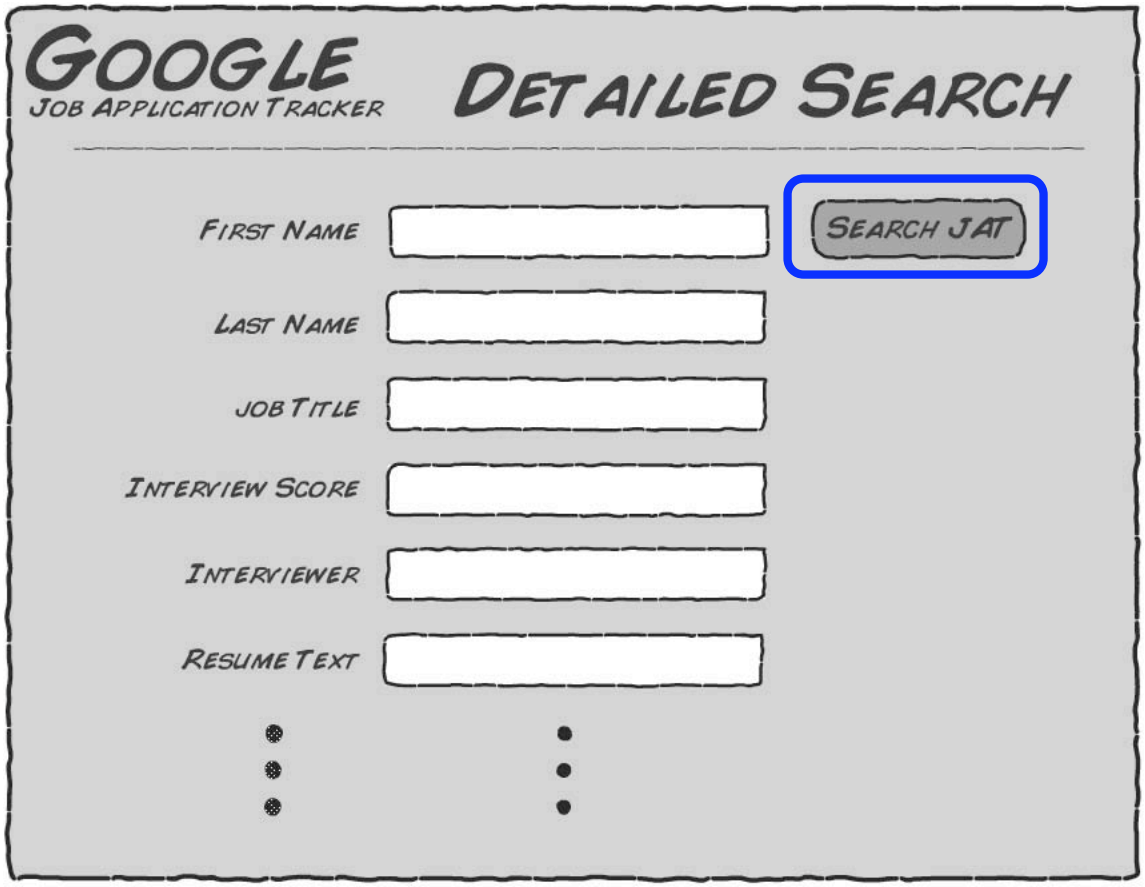
Find



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

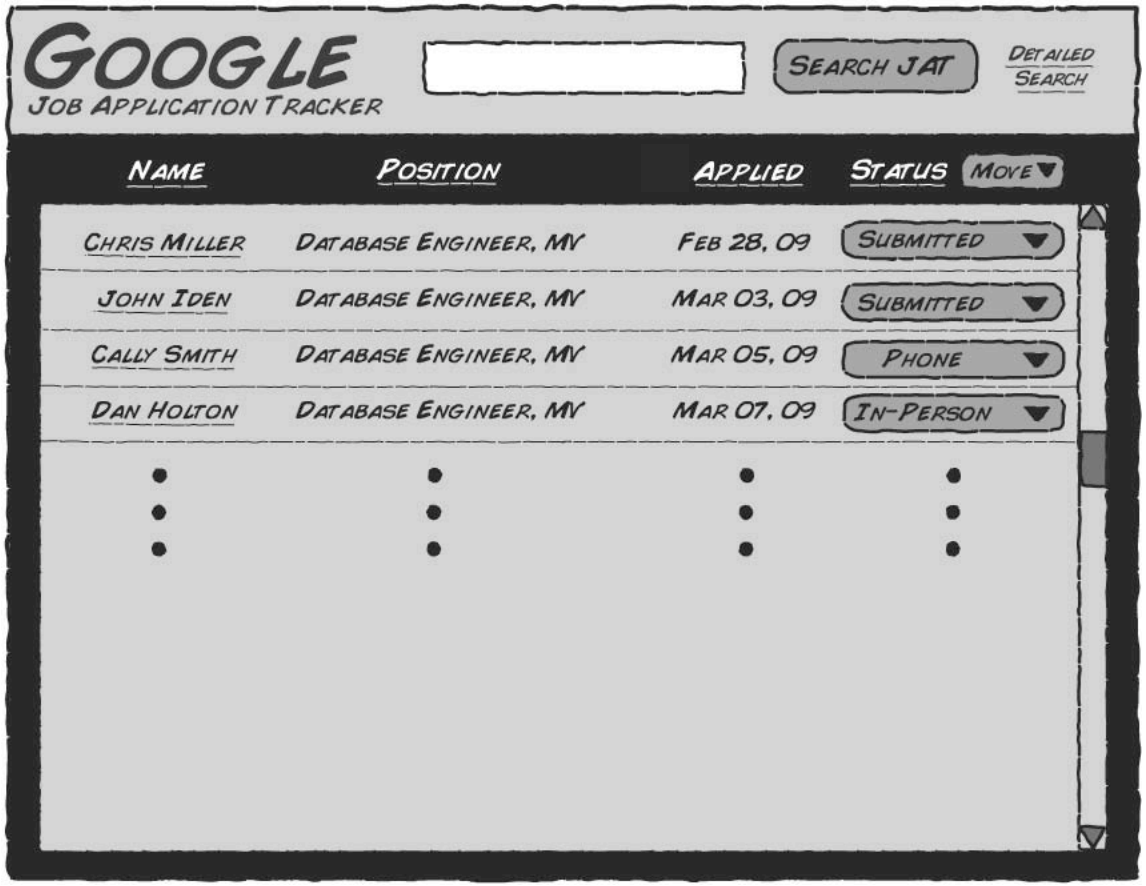
Find



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

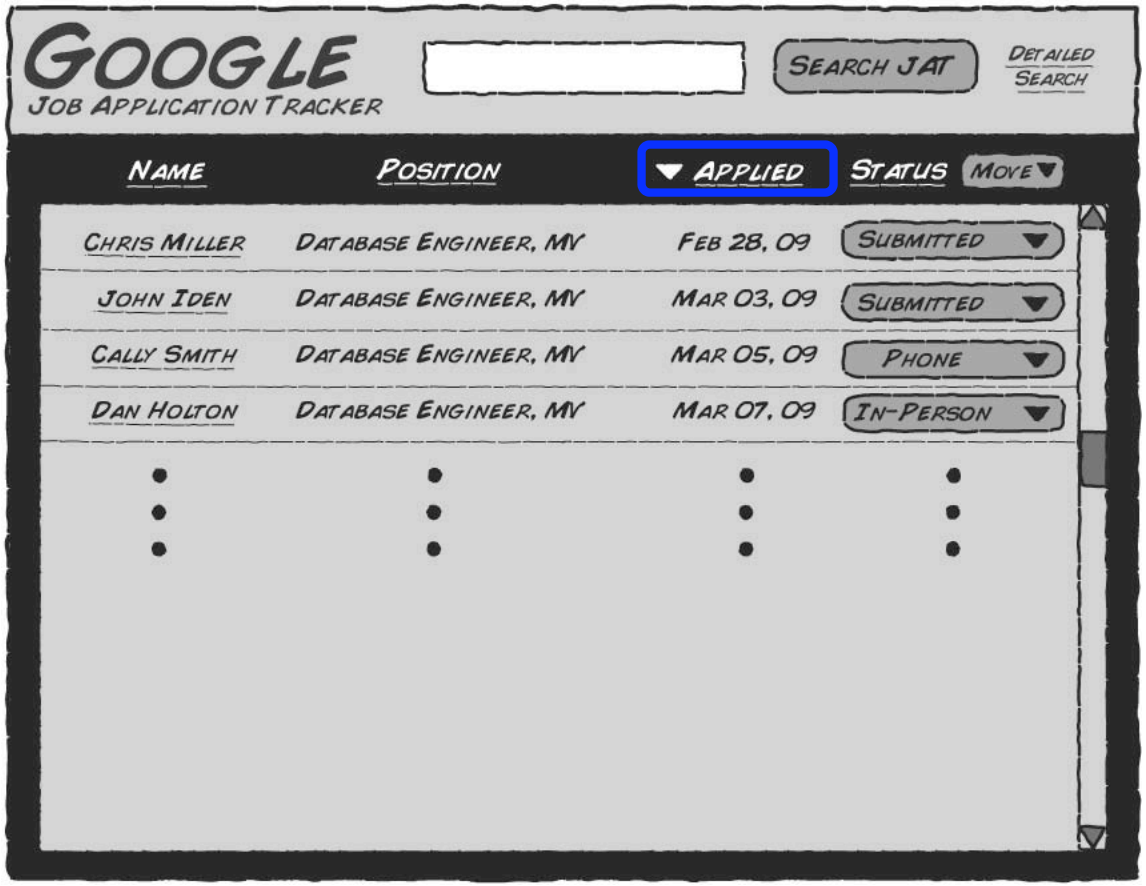
Browse



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

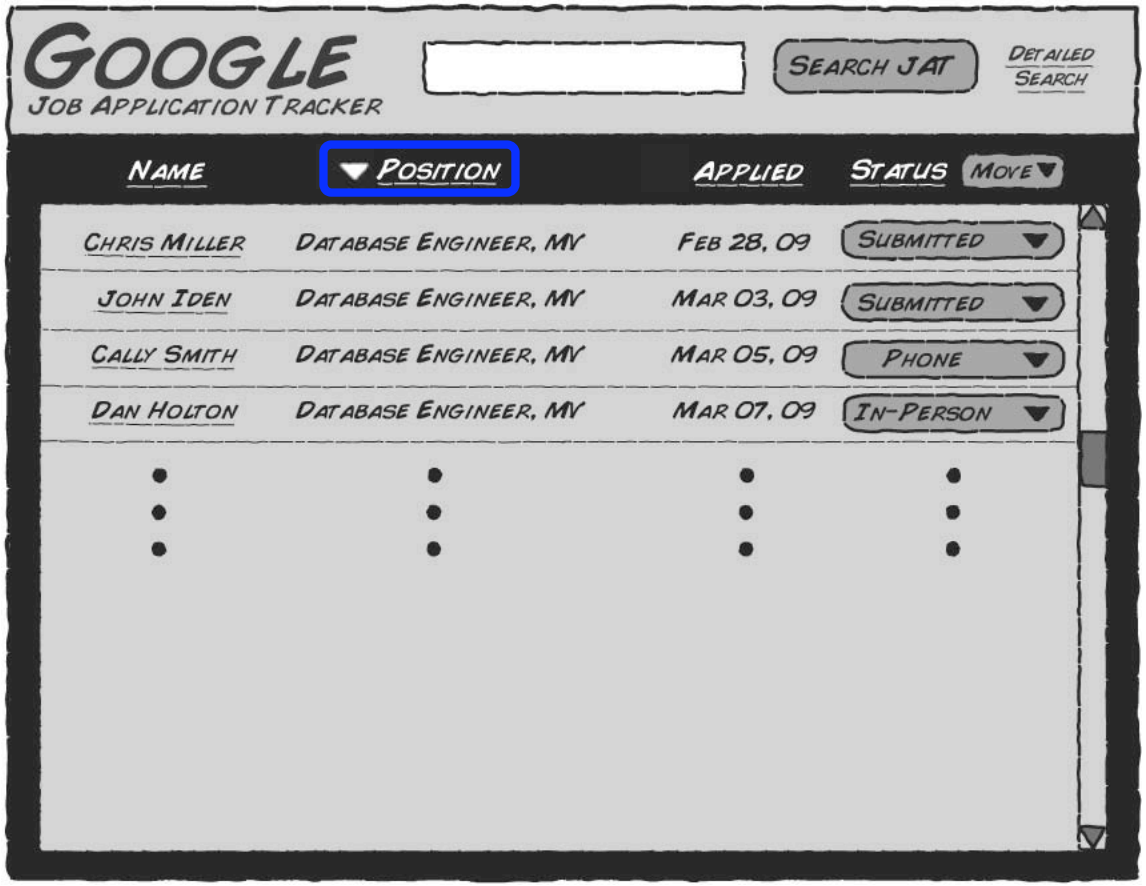
Browse



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

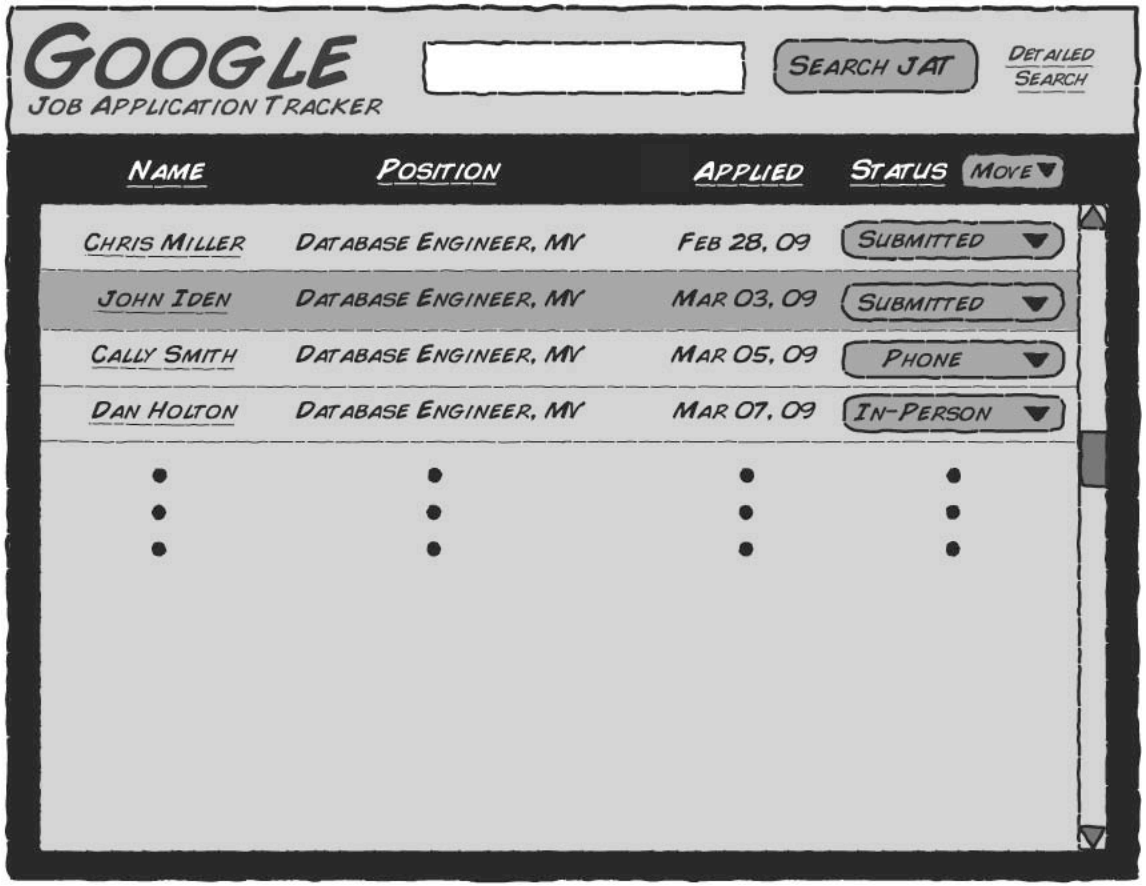
Browse



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

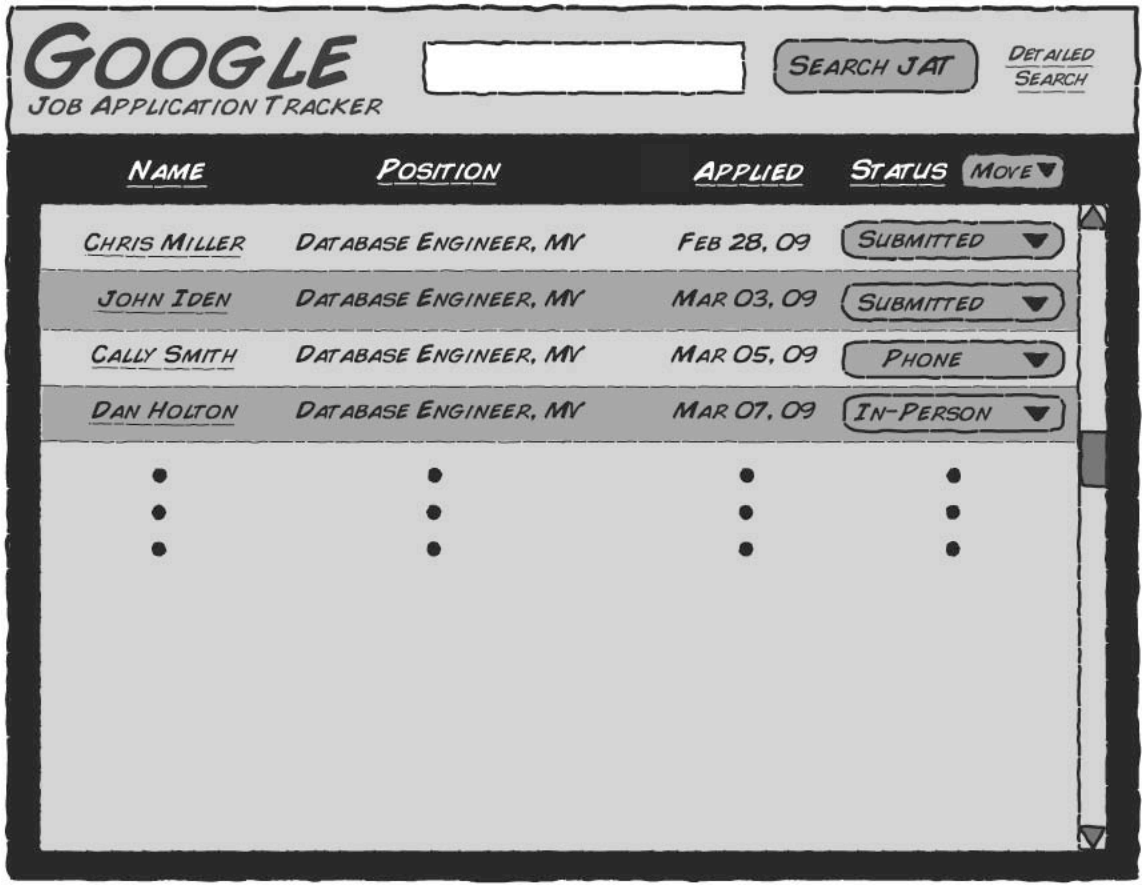
Select



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

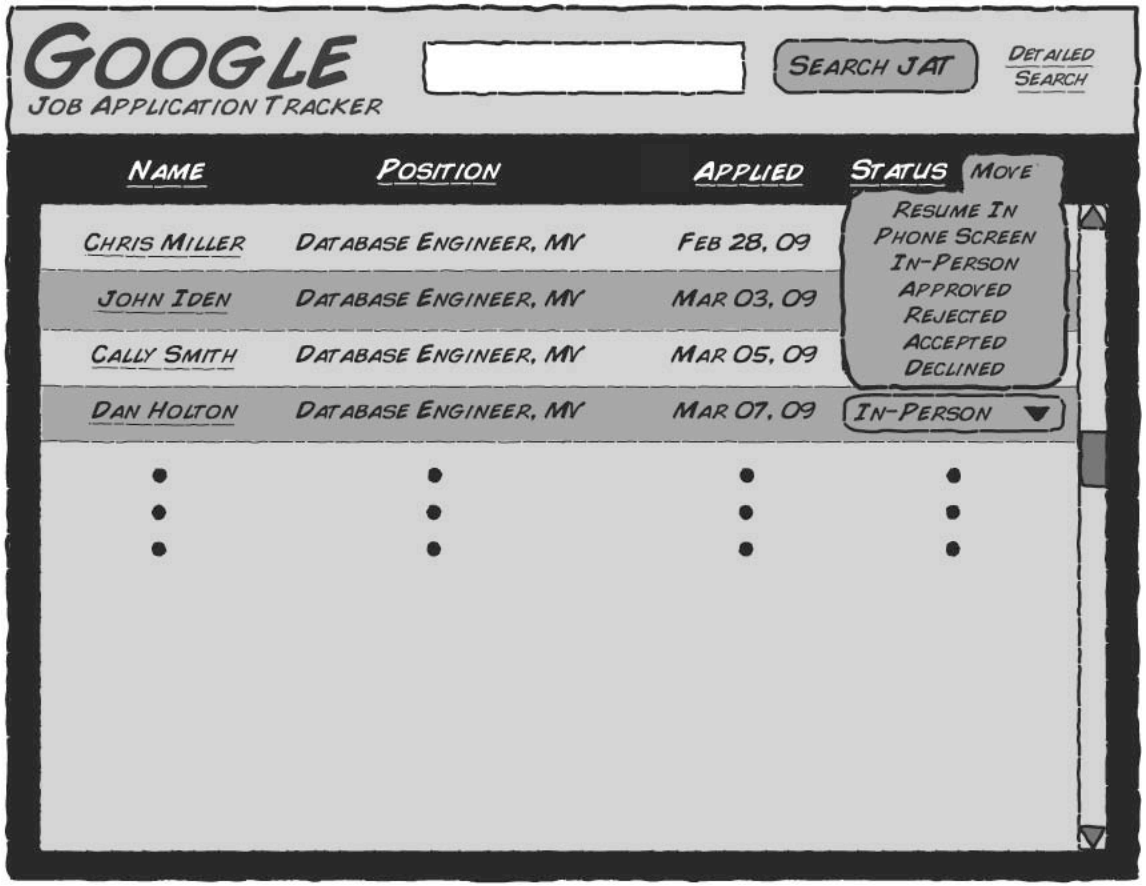
Select multiple



Recruiter-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

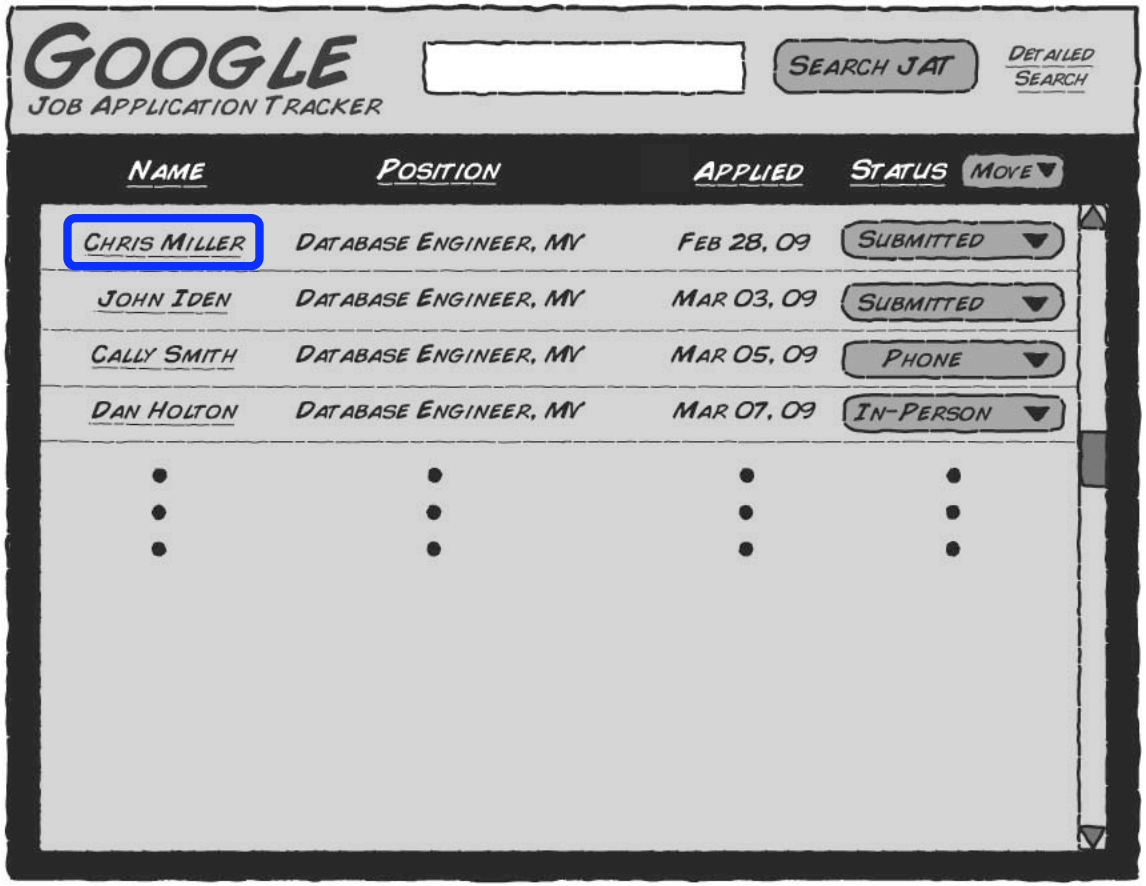
Move



Recruiter-Side Sketches, V3

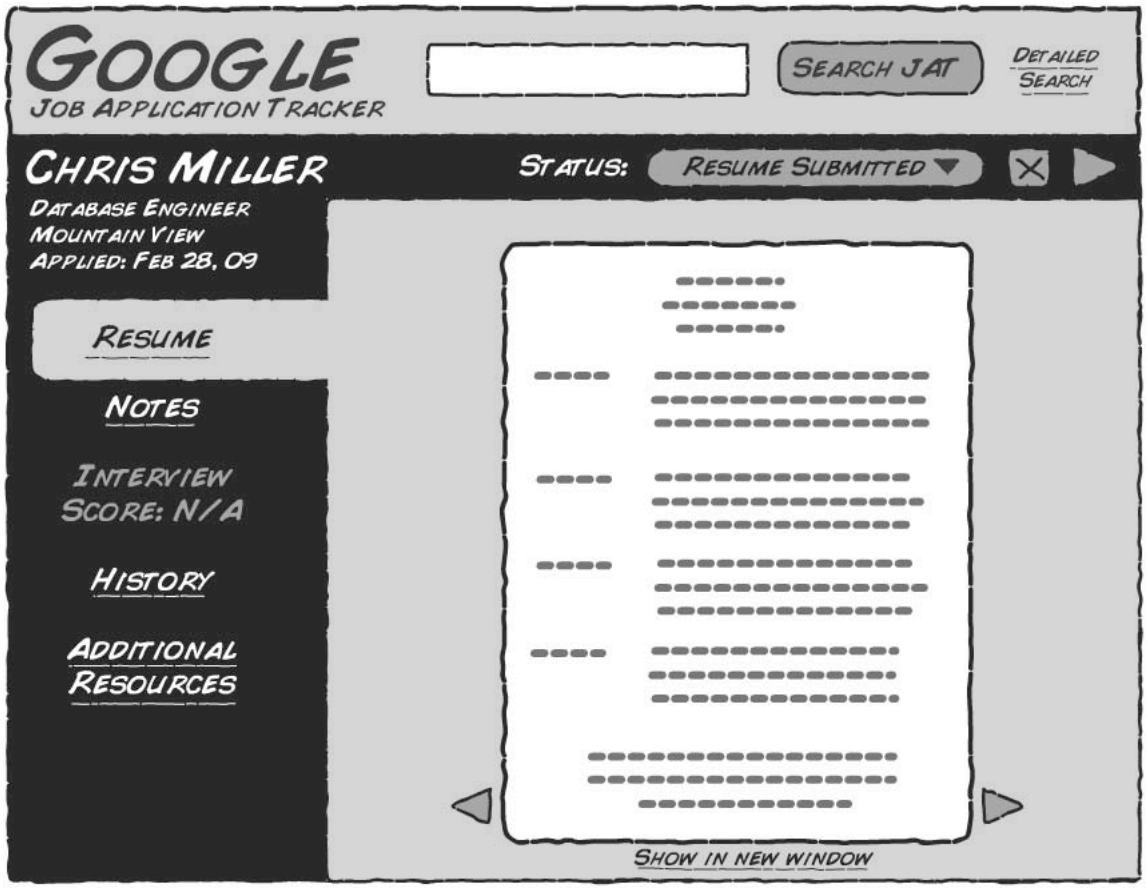
EXPLORE
RELATE
CREATE
EVALUATE

Navigate to Applicant Details



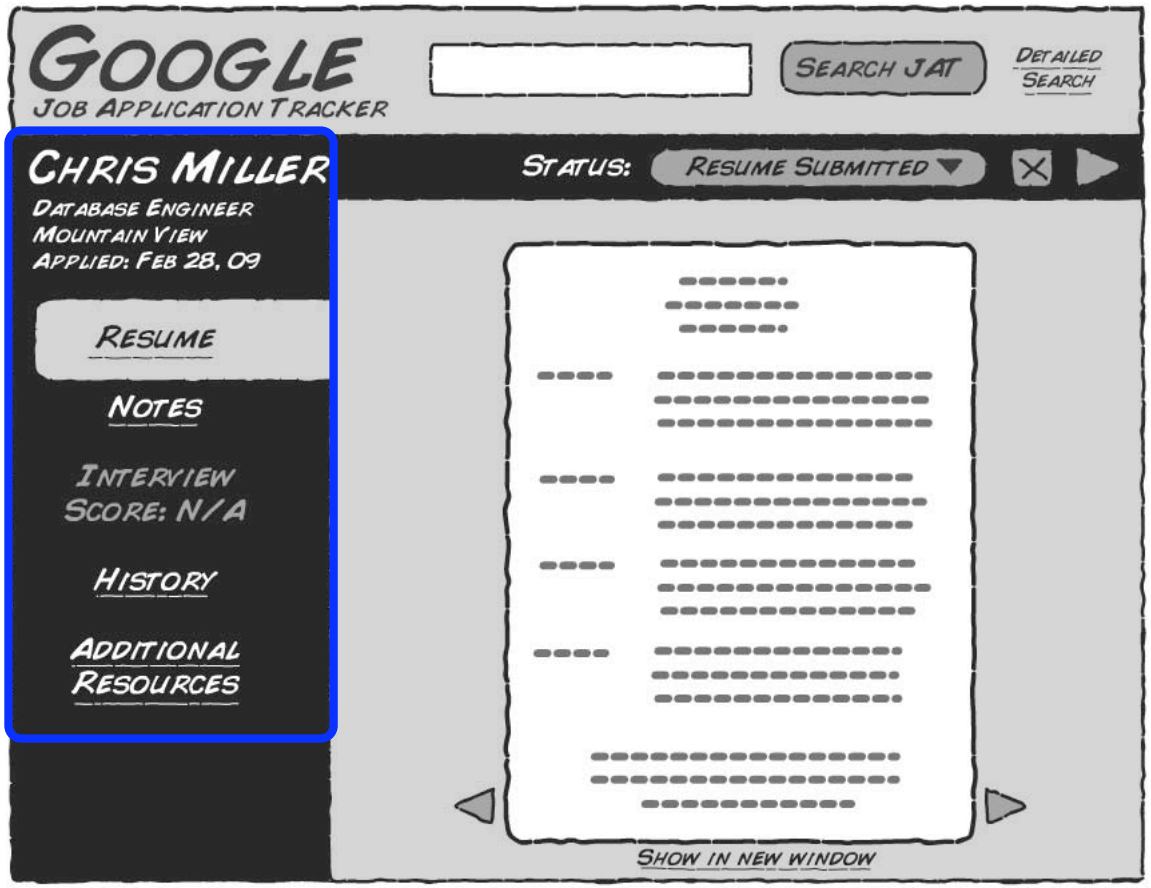
Recruiter-Side Sketches, V3

Applicant Details



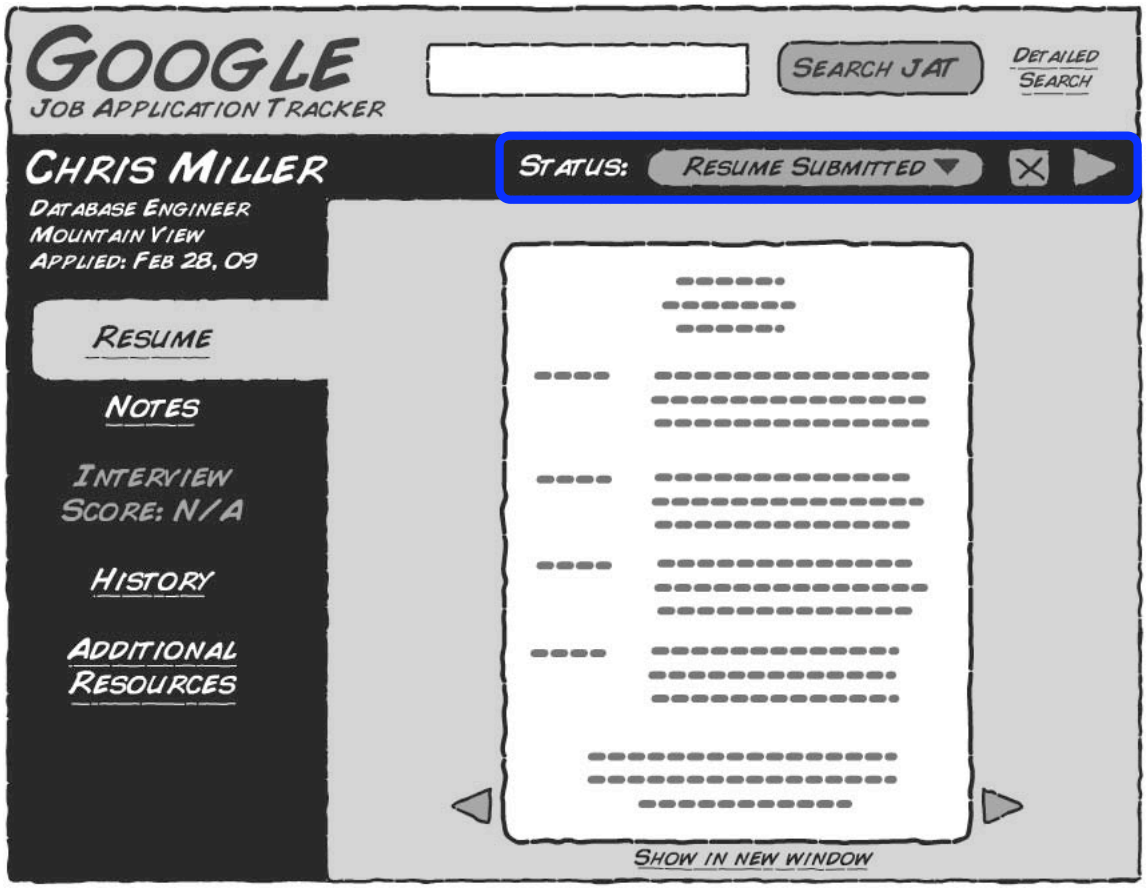
Recruiter-Side Sketches, V3

Applicant Details



Recruiter-Side Sketches, V3

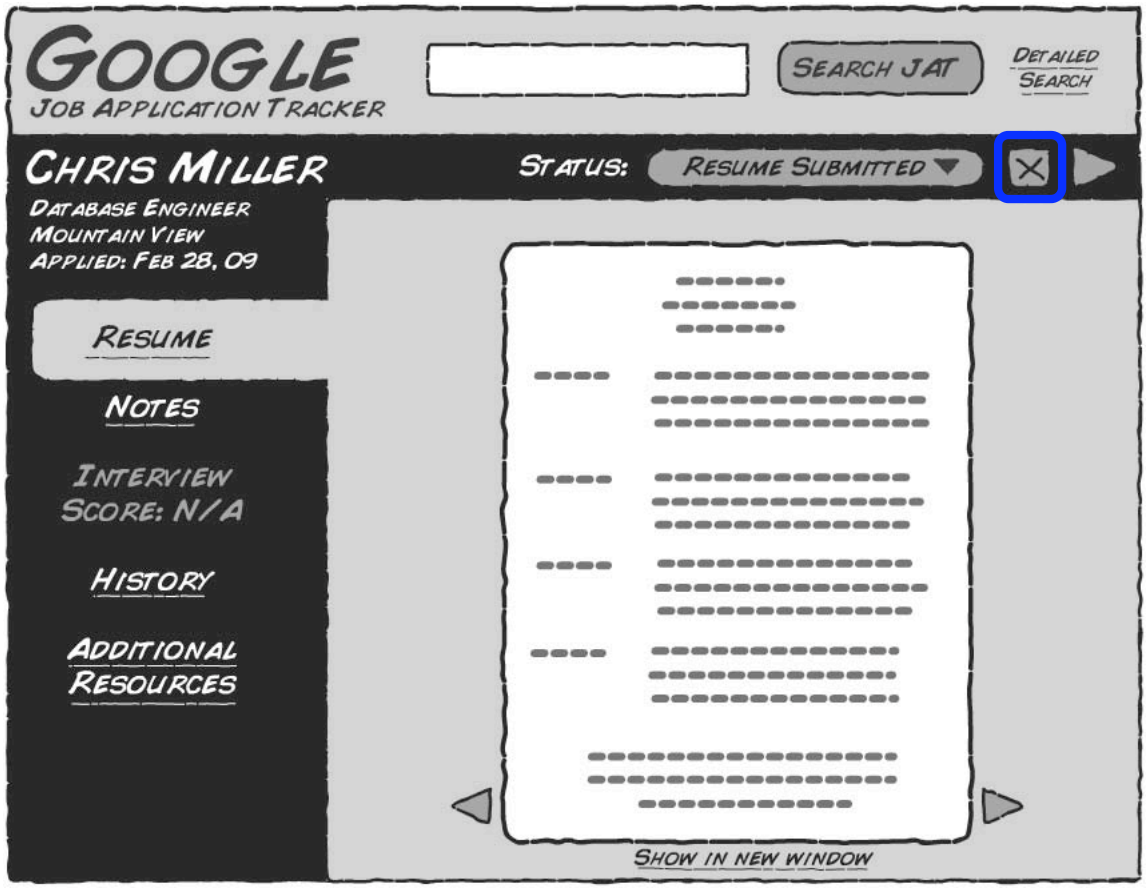
Applicant Details



EXPLORE
RELATE
CREATE
EVALUATE

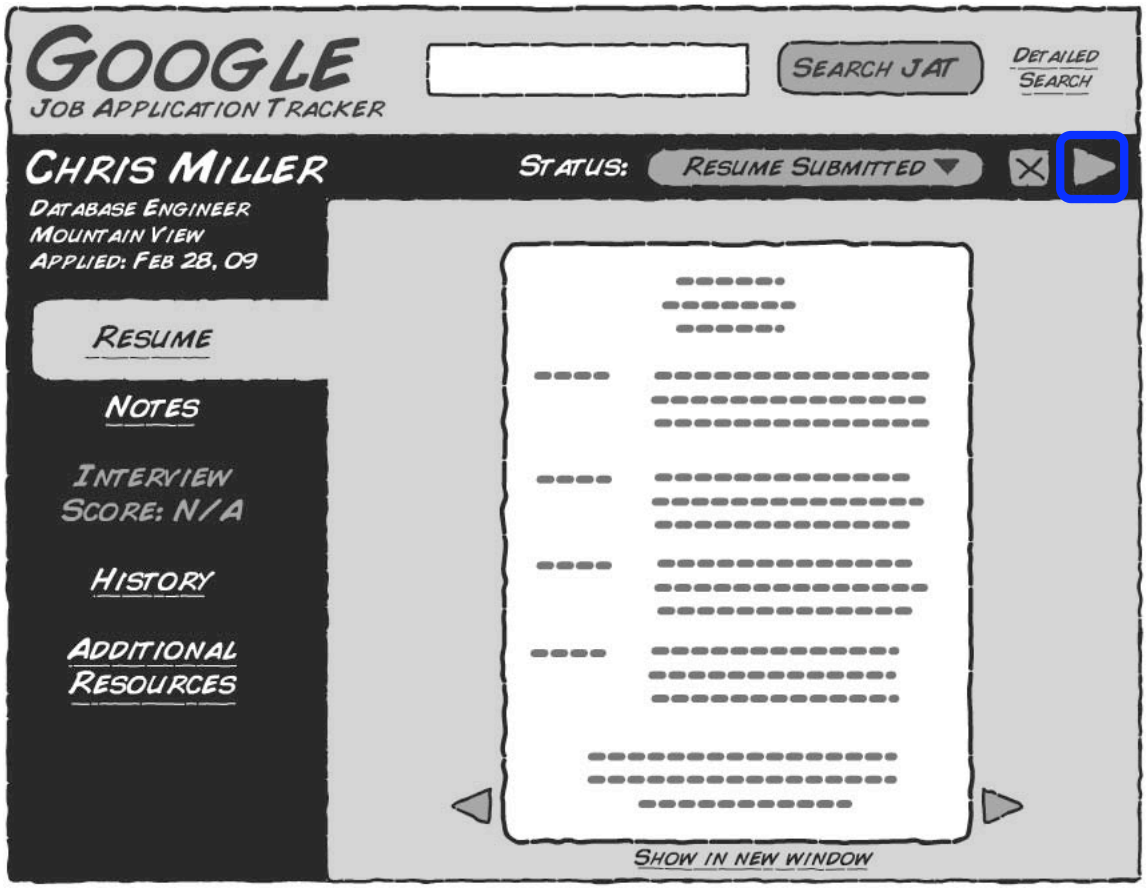
Recruiter-Side Sketches, V3

Applicant Details

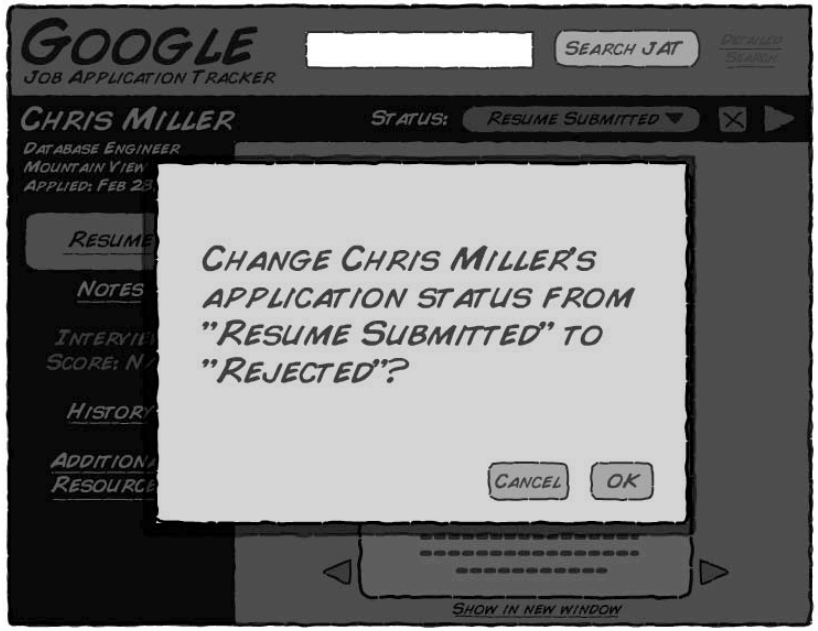


Recruiter-Side Sketches, V3

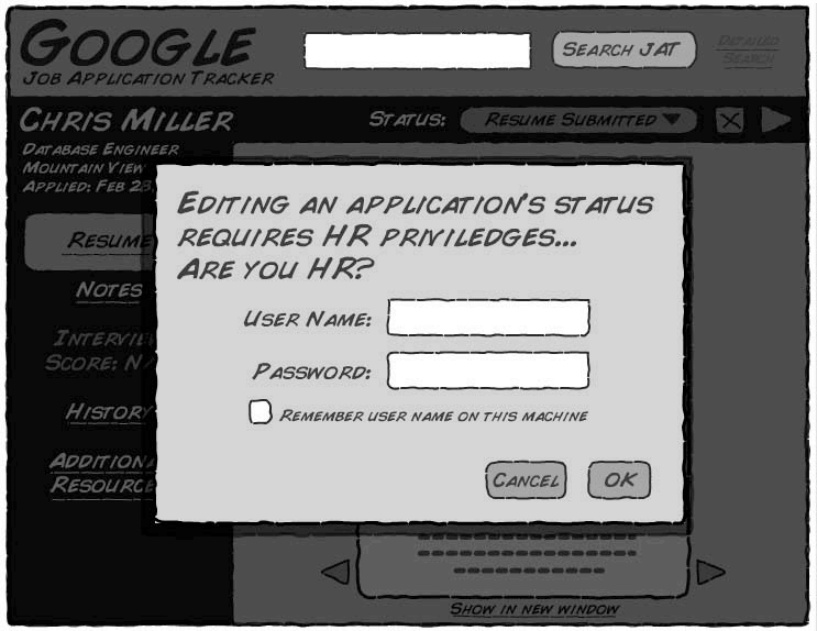
Applicant Details



Recruiter-Side Sketches, V3

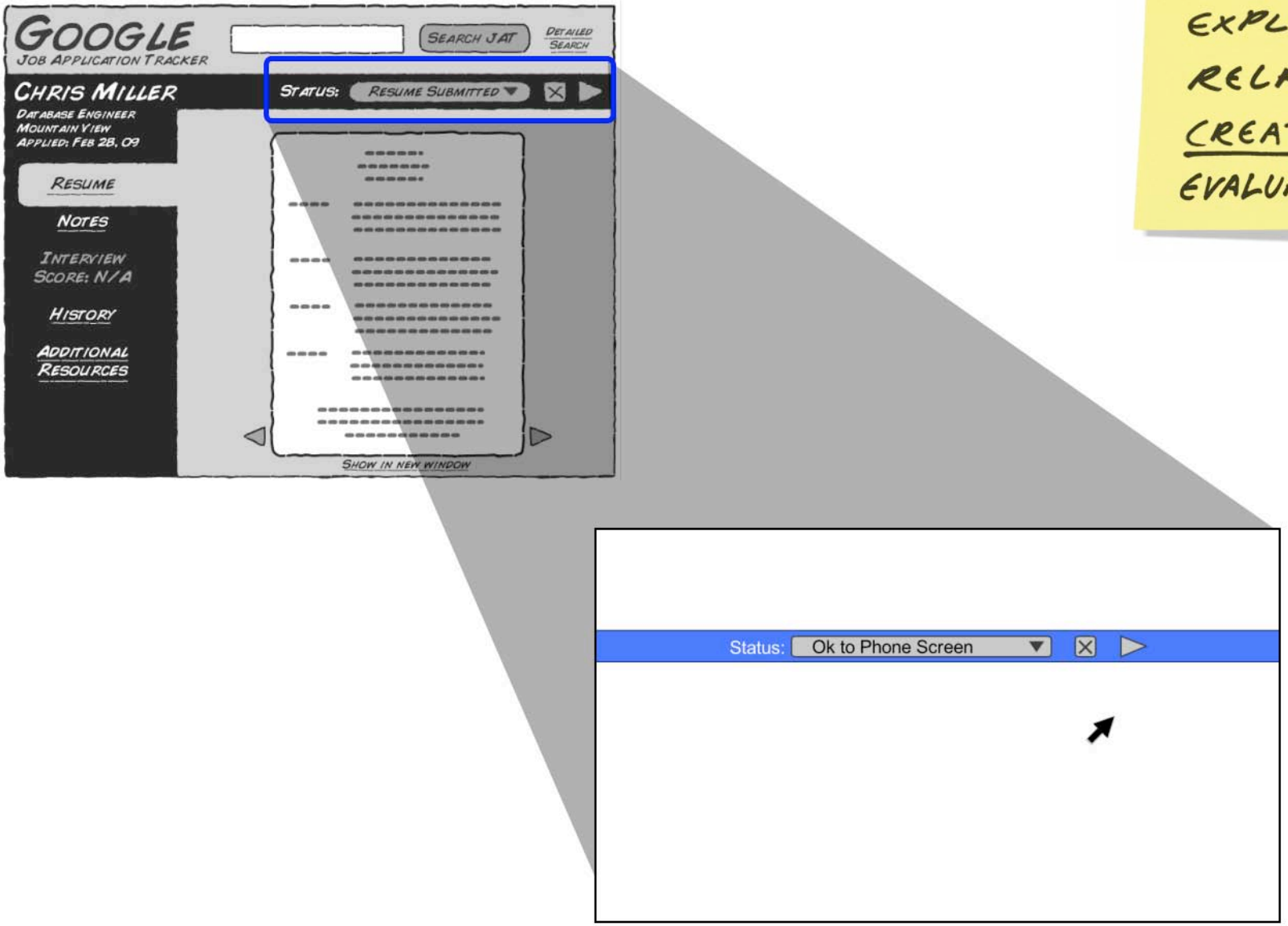


Confirmation



Authentication

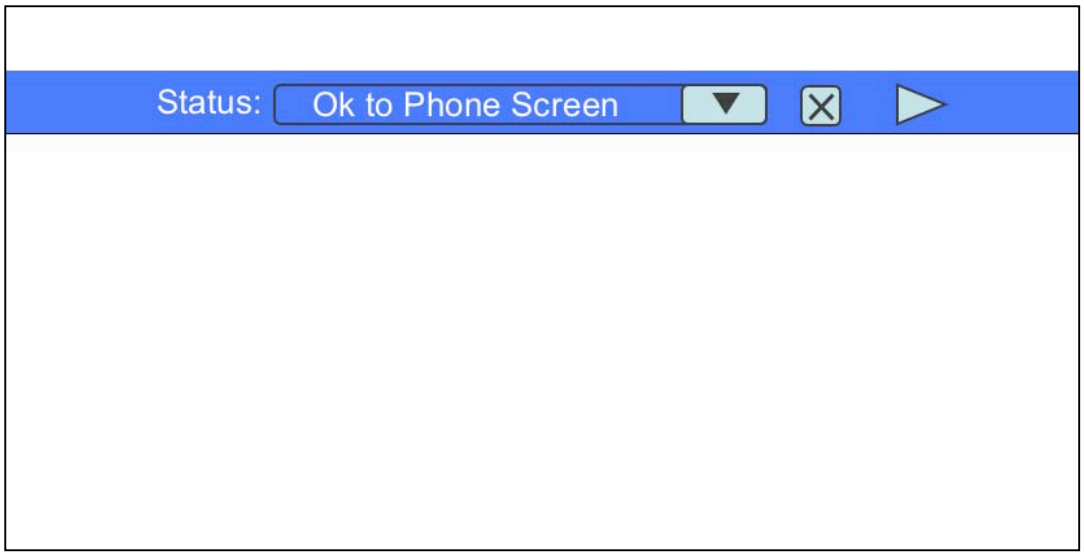
Recruiter-Side Detail



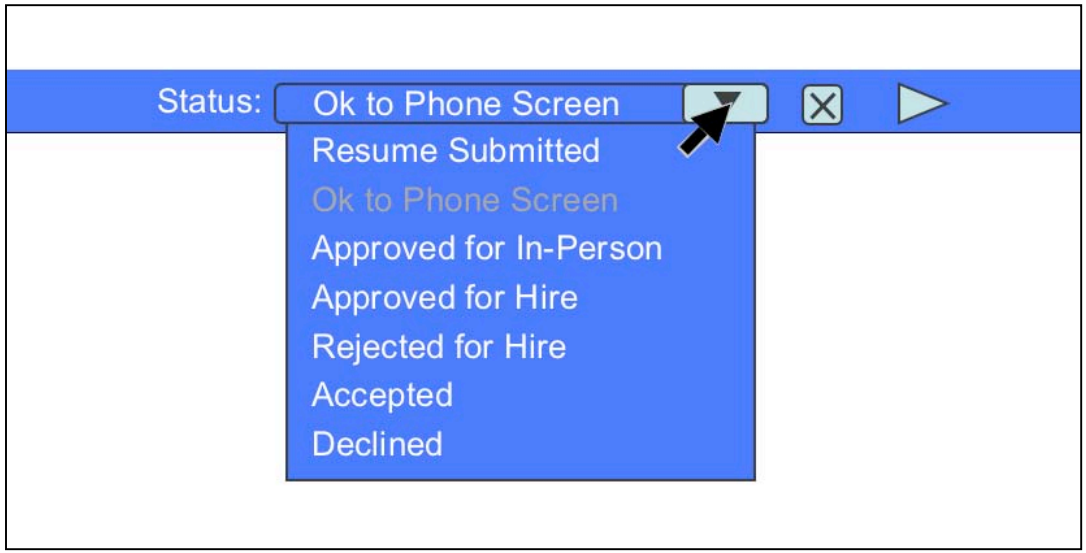
EXPLORE
RELATE
CREATE
EVALUATE

Recruiter-Side Detail

1.

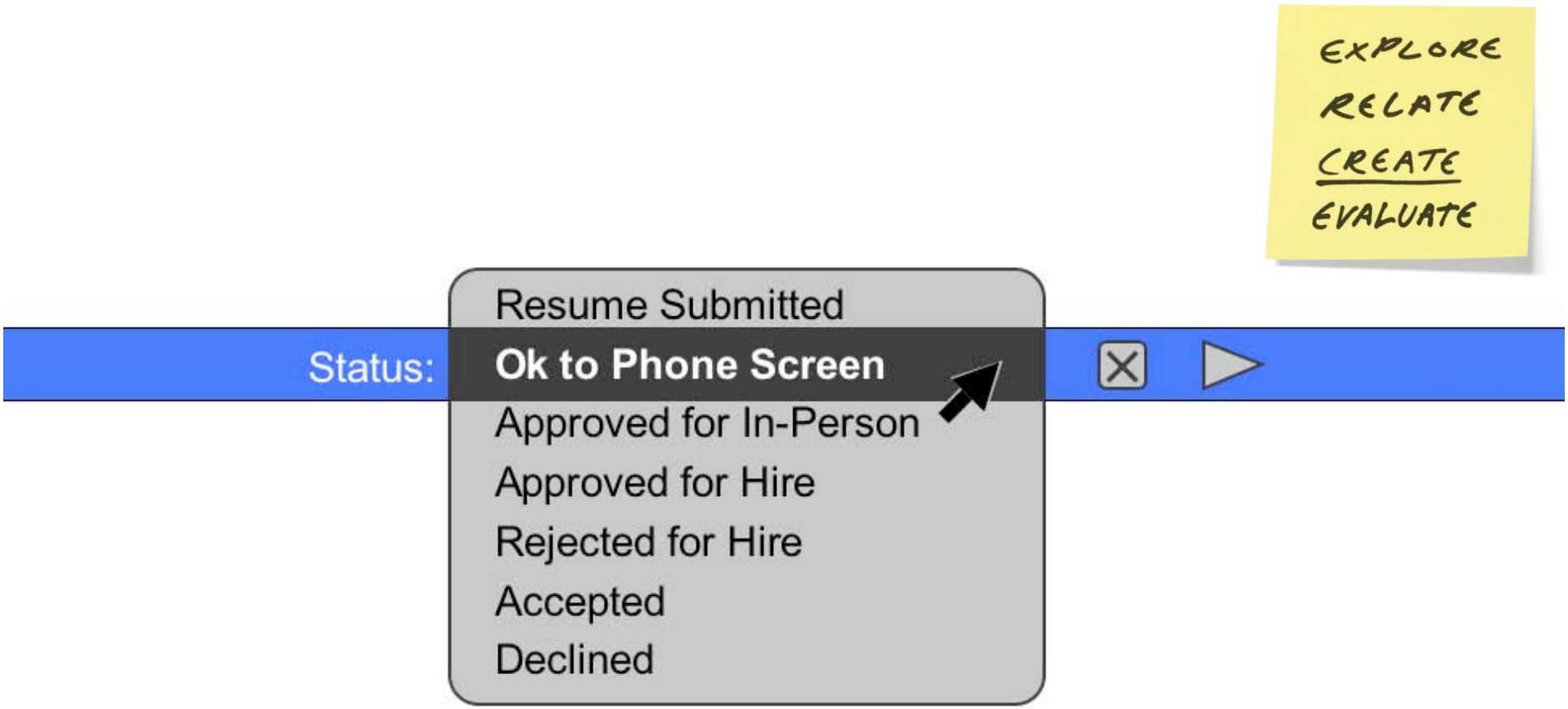


2.



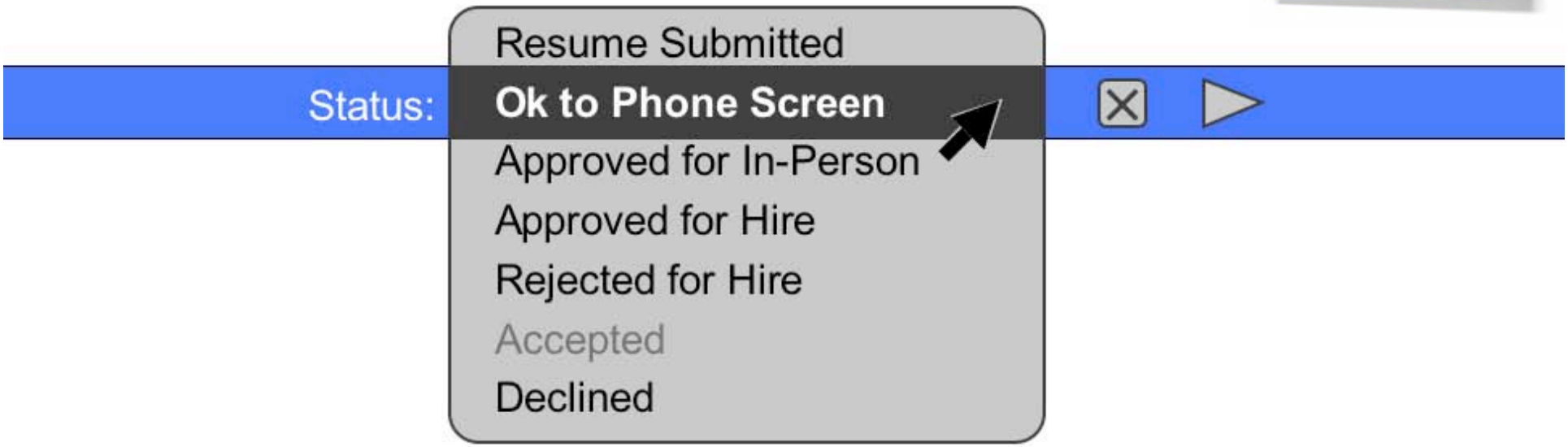
Recruiter-Side Detail

Recruiter-Side Detail

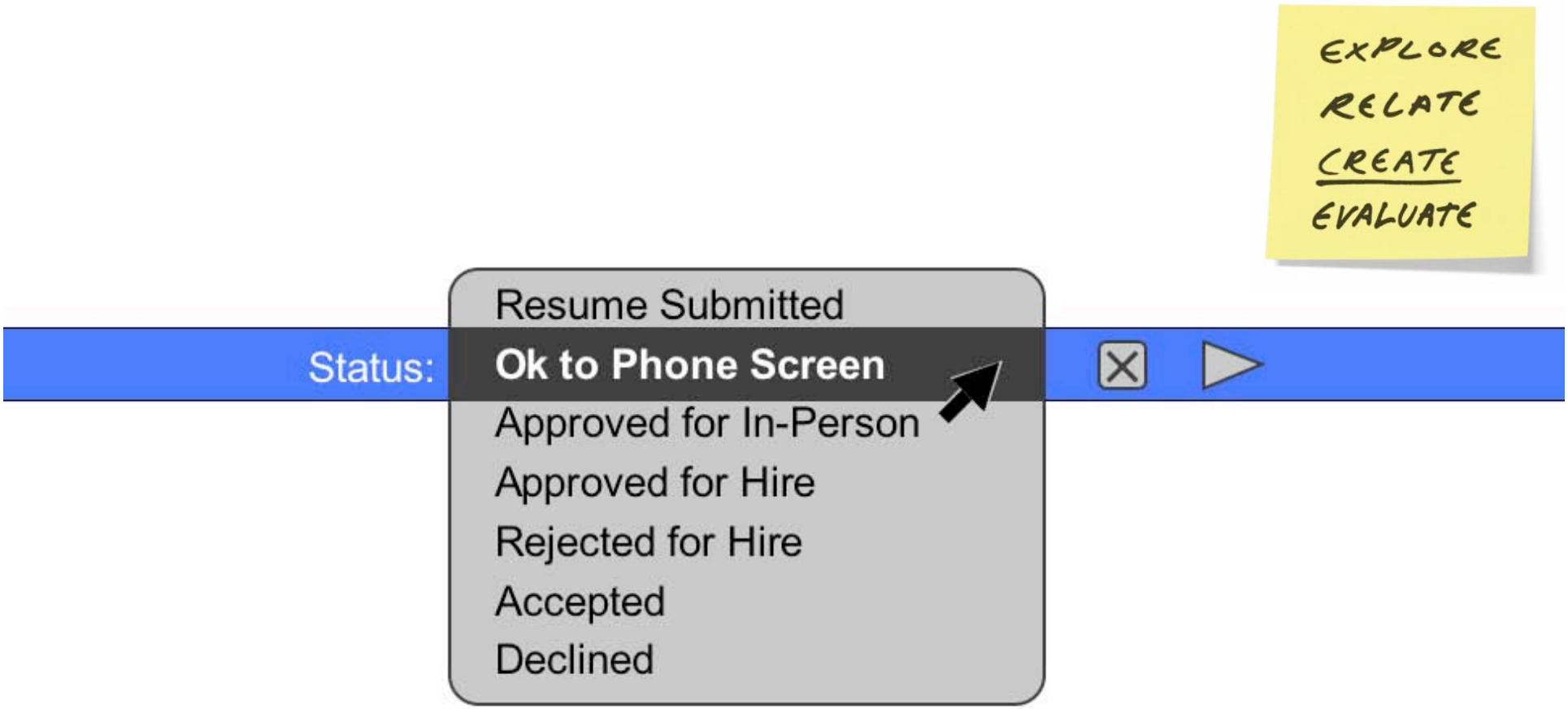


Recruiter-Side Detail

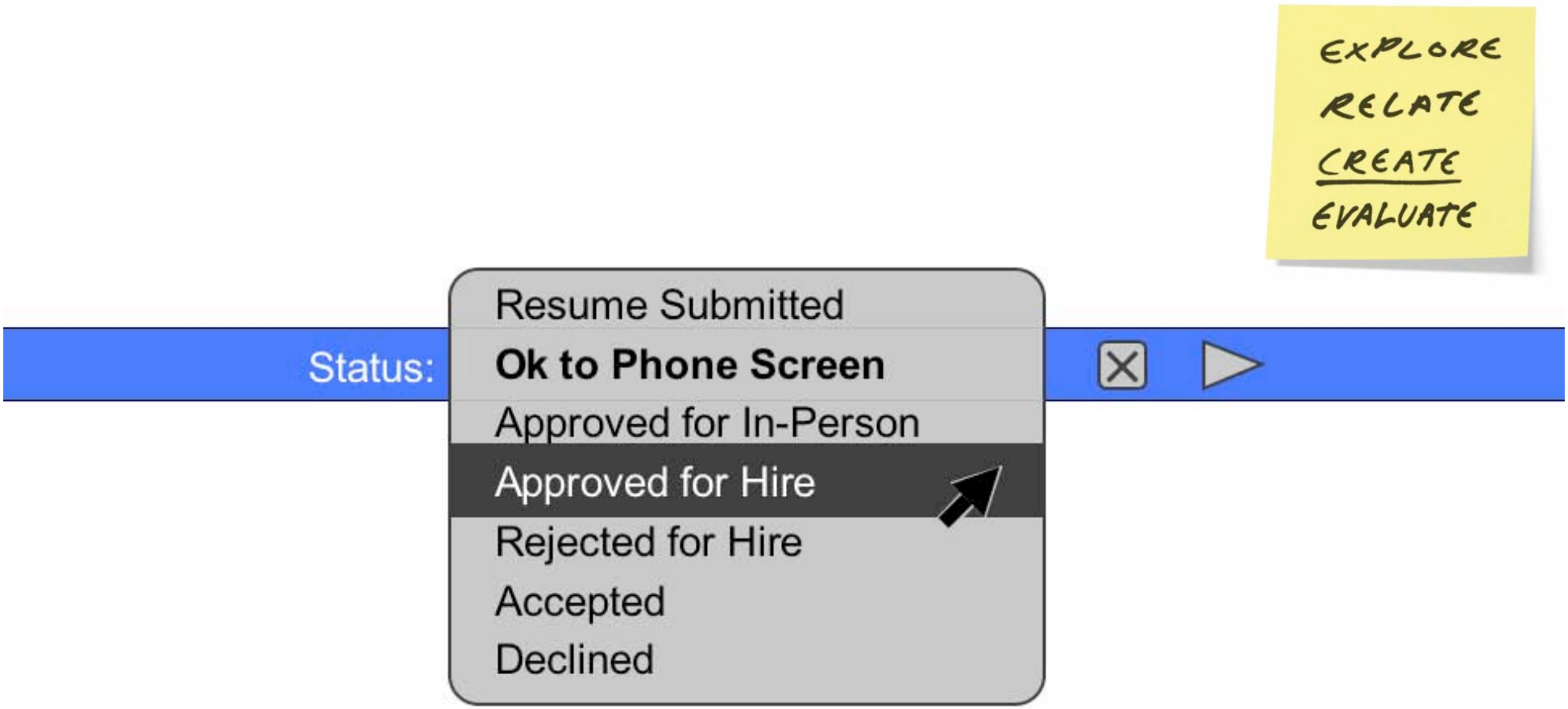
EXPLORE
RELATE
CREATE
EVALUATE



Recruiter-Side Detail

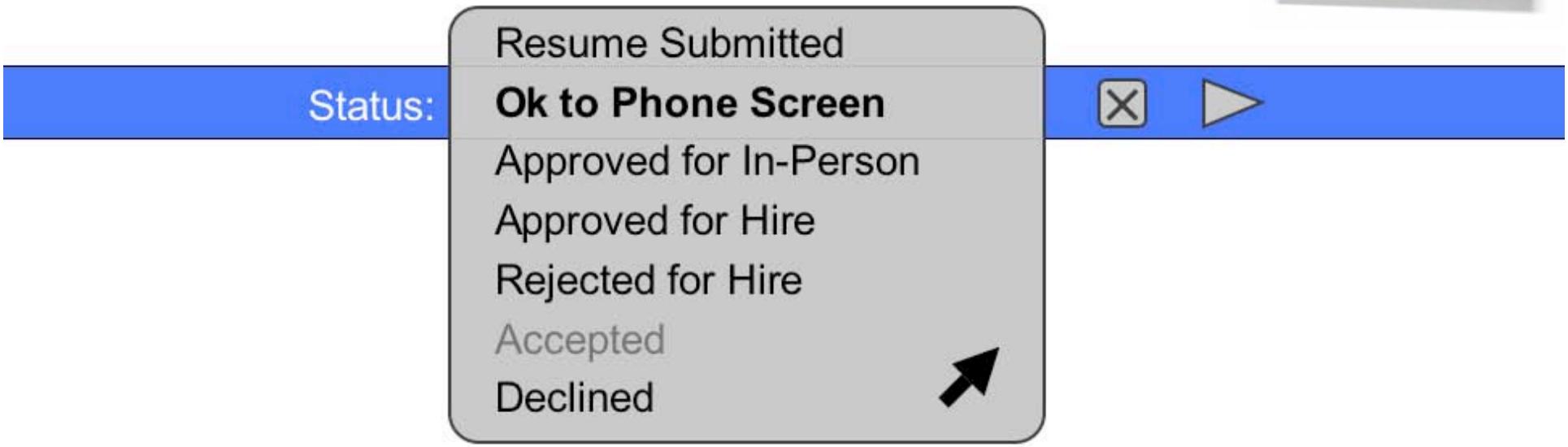


Recruiter-Side Detail

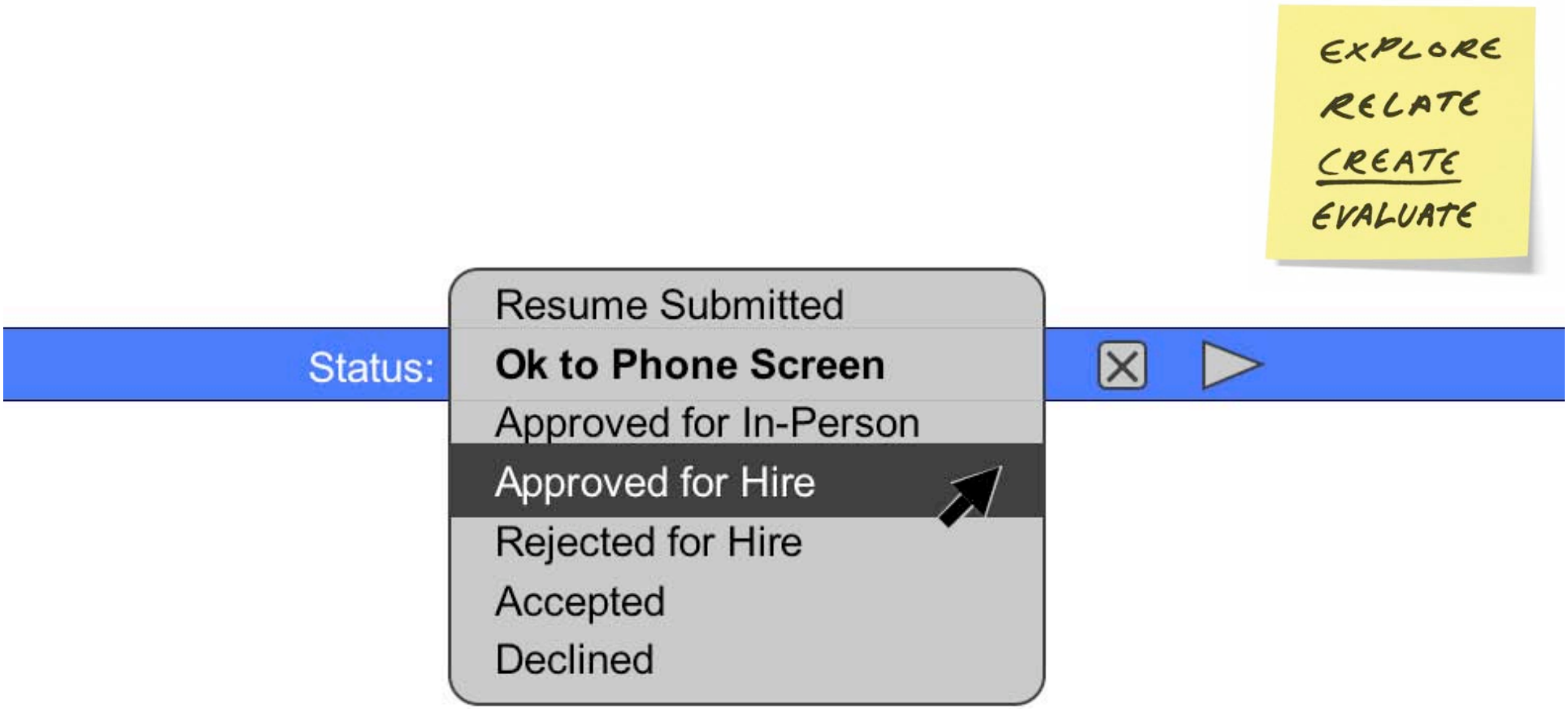


Recruiter-Side Detail

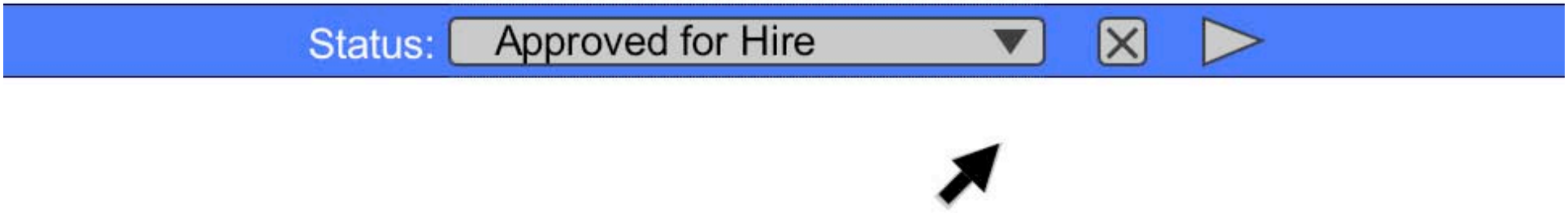
EXPLORE
RELATE
CREATE
EVALUATE



Recruiter-Side Detail



Recruiter-Side Detail



Recruiter-Side Detail

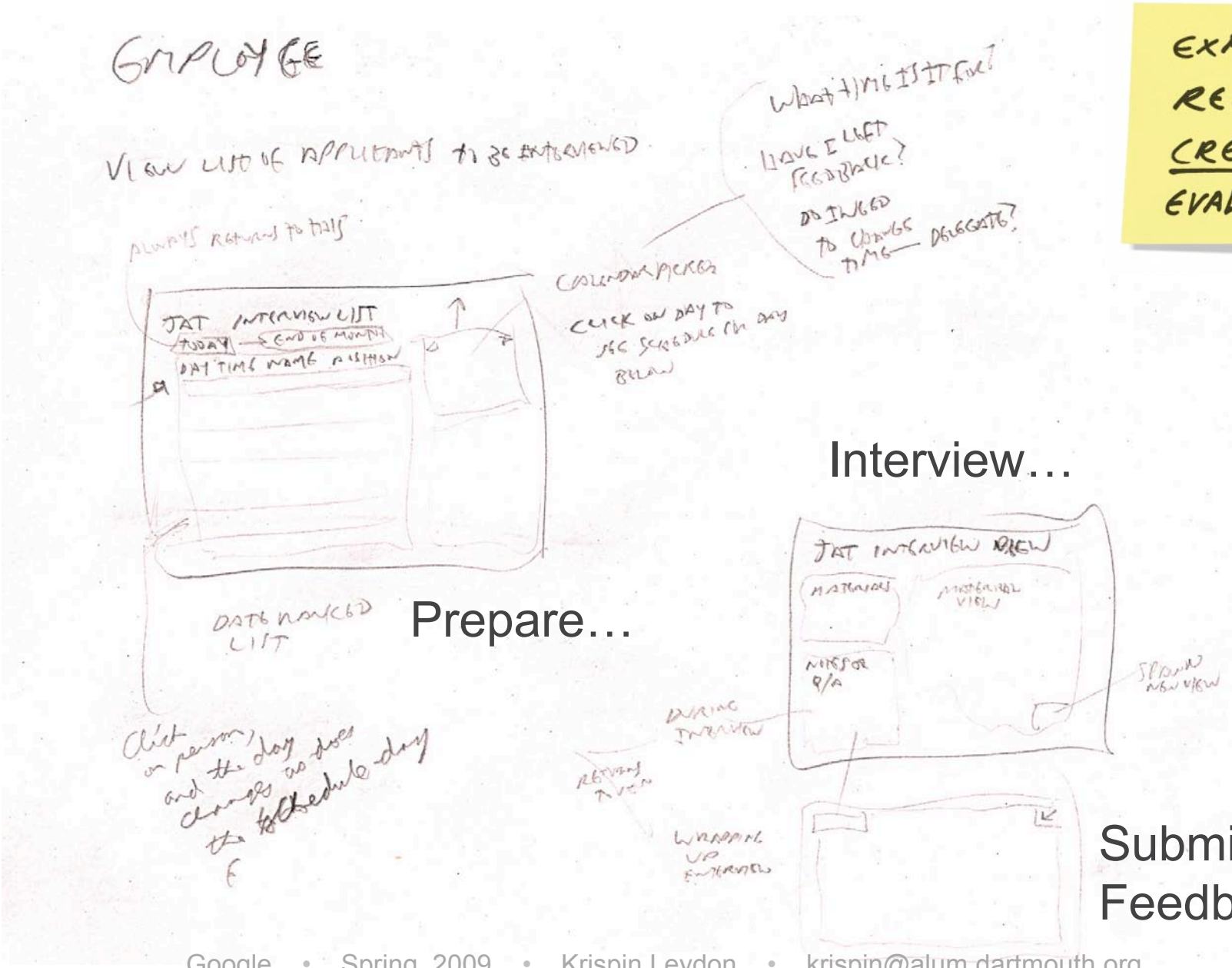
Interviewer Tasks

Prepare for Interview
- Review applicant info
- Check schedule

Conduct Interview
- Reference applicant info
- Take notes

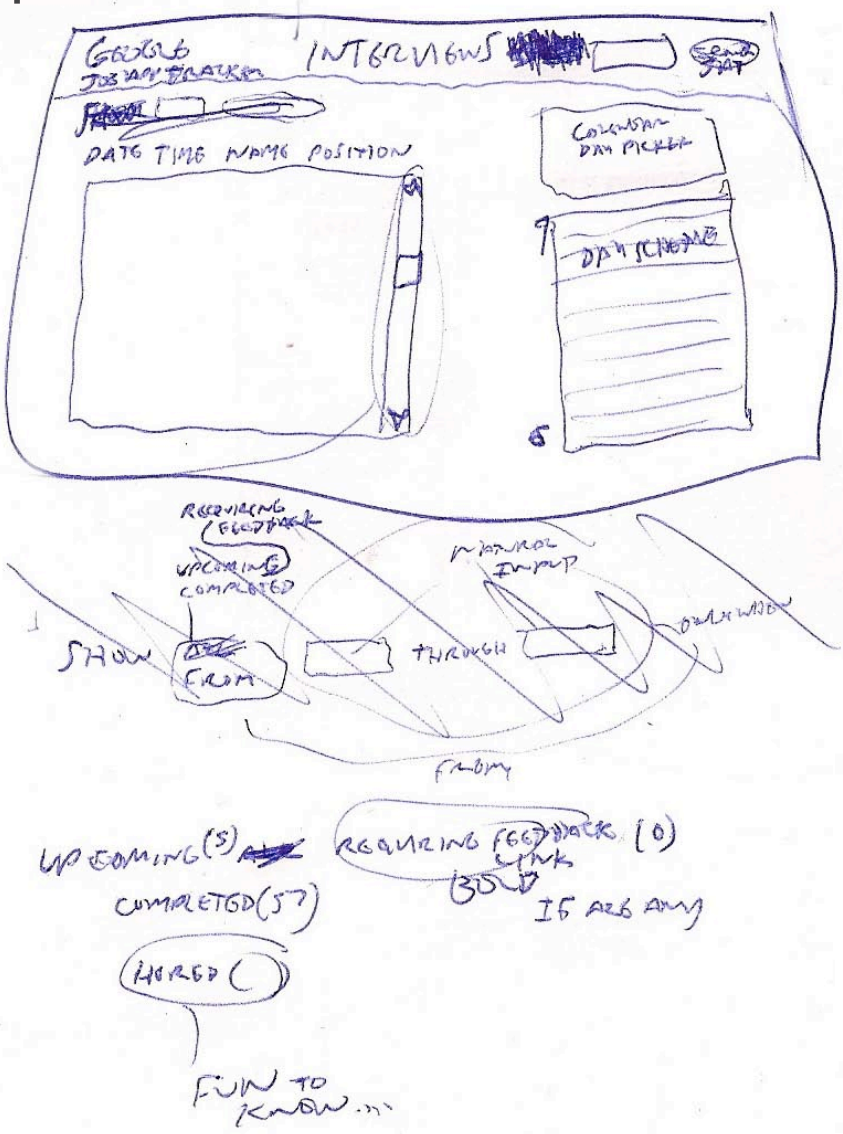
Provide Feedback
- Write & Submit Feedback
- Reference applicant info

Interviewer-Side Sketches, V1



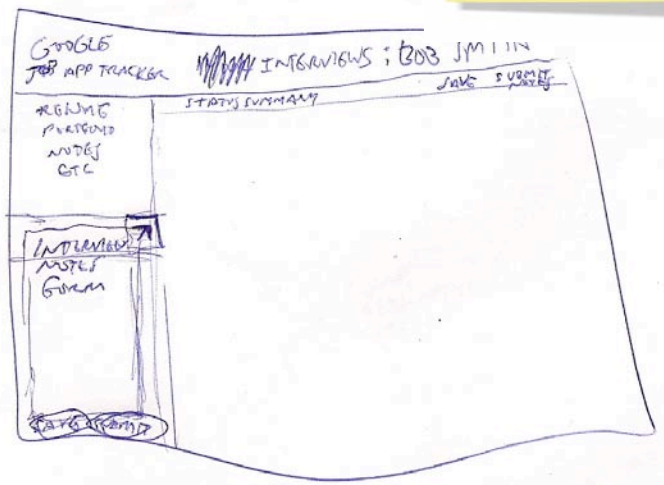
Interviewer-Side Sketches, V2

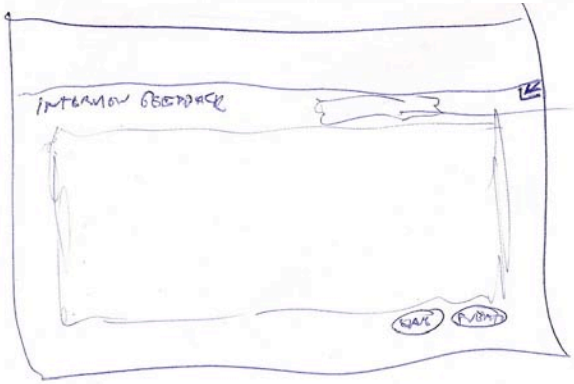
Prepare…



EXPLORE
RELATE
CREATE
EVALUATE

Interview…

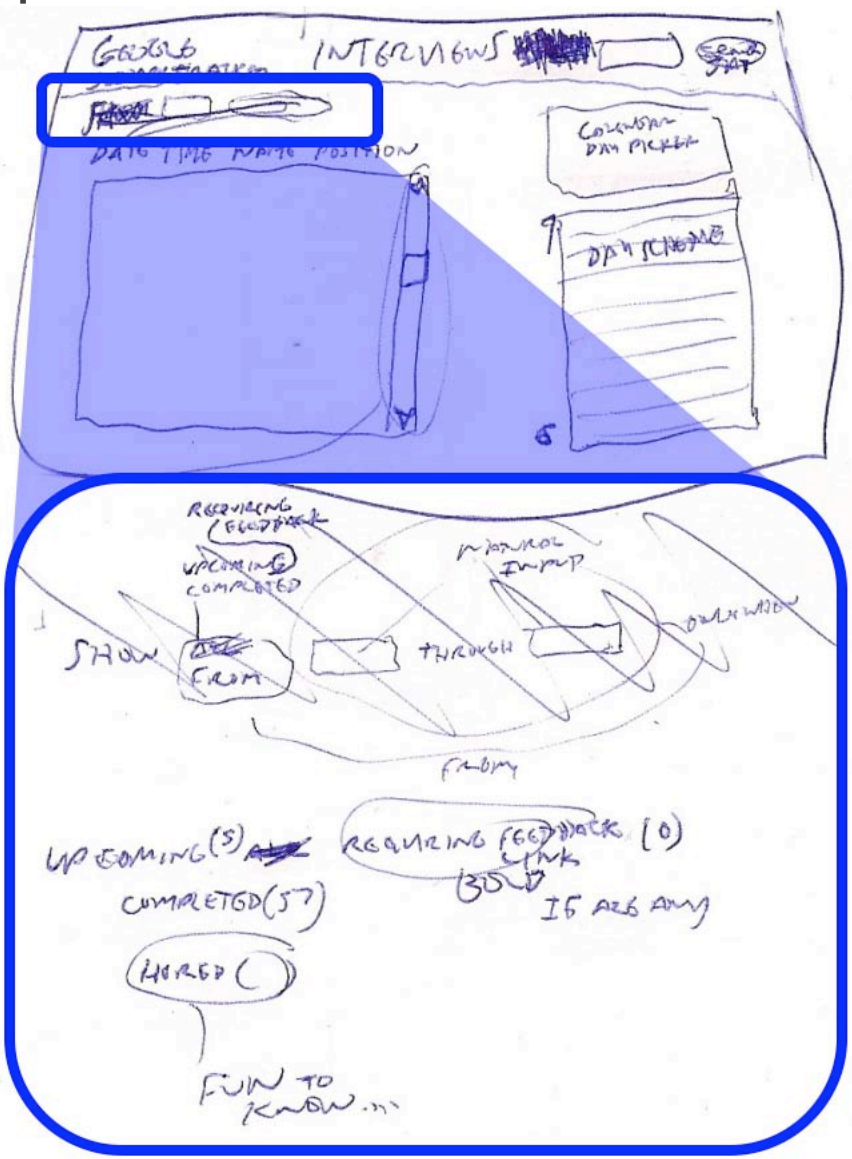




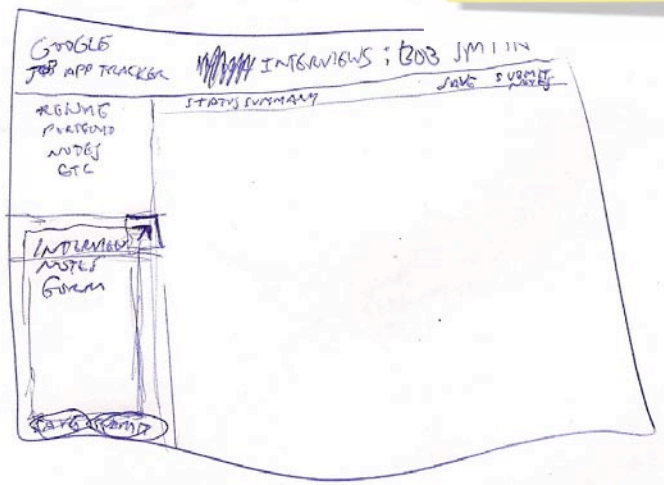
Submit Feedback…

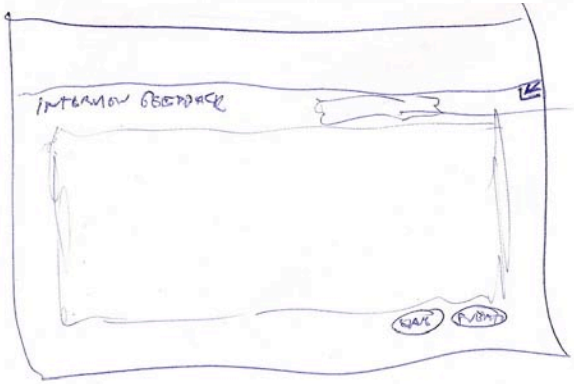
Interviewer-Side Sketches, V2

Prepare…



Interview…





EXPLORE
RELATE
CREATE
EVALUATE

Submit Feedback…

Interviewer-Side Sketches, V2

How to Present the List of Applicants?

1. List of Upcoming Interviews, Next ~30 Days

Interviewer-Side Sketches, V2

How to Present the List of Applicants?

1. List of Upcoming Interviews, Next ~30 Days

Interviewer-Side Sketches, V2

How to Present the List of Applicants?

1. List of Upcoming Interviews, Next ~30 Days
2. “From” and “To” Date Entry Boxes

Interviewer-Side Sketches, V2

How to Present the List of Applicants?

1. List of Upcoming Interviews, Next ~30 Days
2. “From” and “To” Date Entry Boxes
3. Completed(34) Feedback(1) Upcoming(20)

Interviewer-Side Sketches, V2

How to Present the List of Applicants?

1. List of Upcoming Interviews, Next ~30 Days
2. “From” and “To” Date Entry Boxes
3. Completed(34) Feedback(1) Upcoming(20)

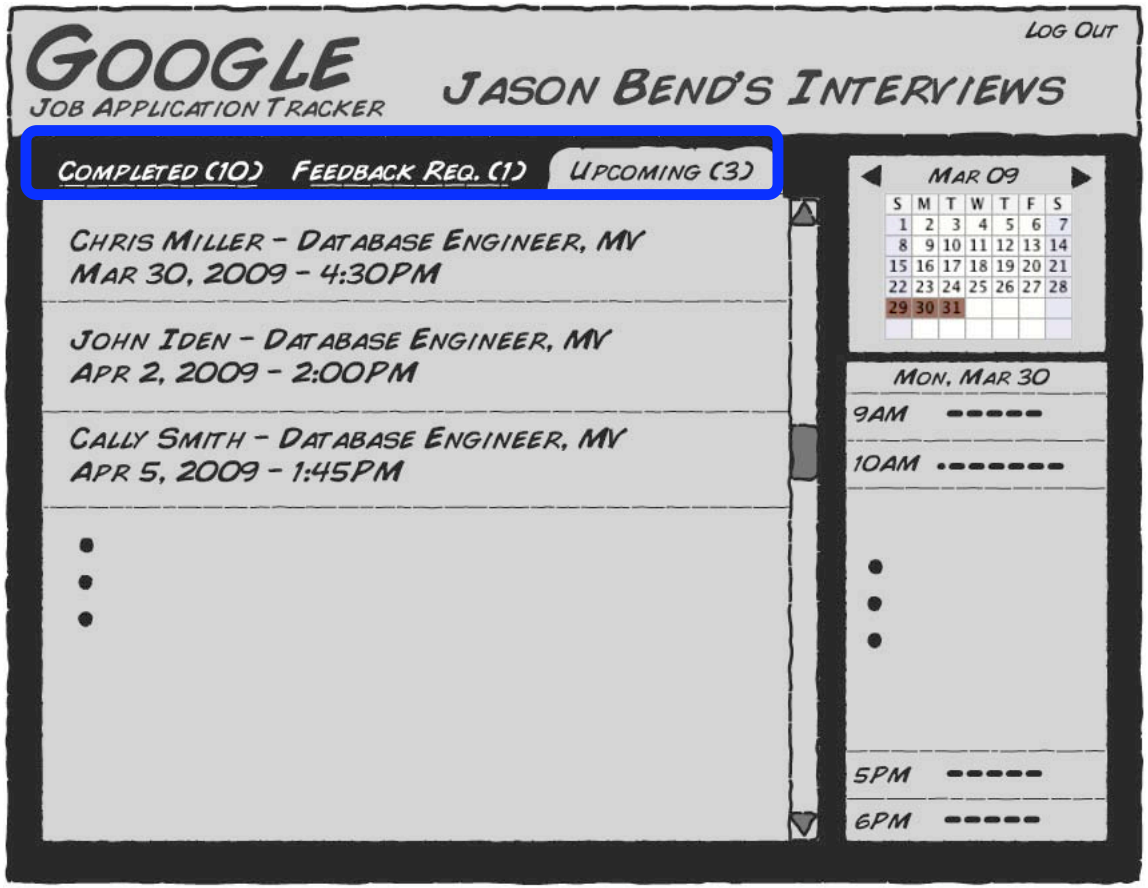
+

Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

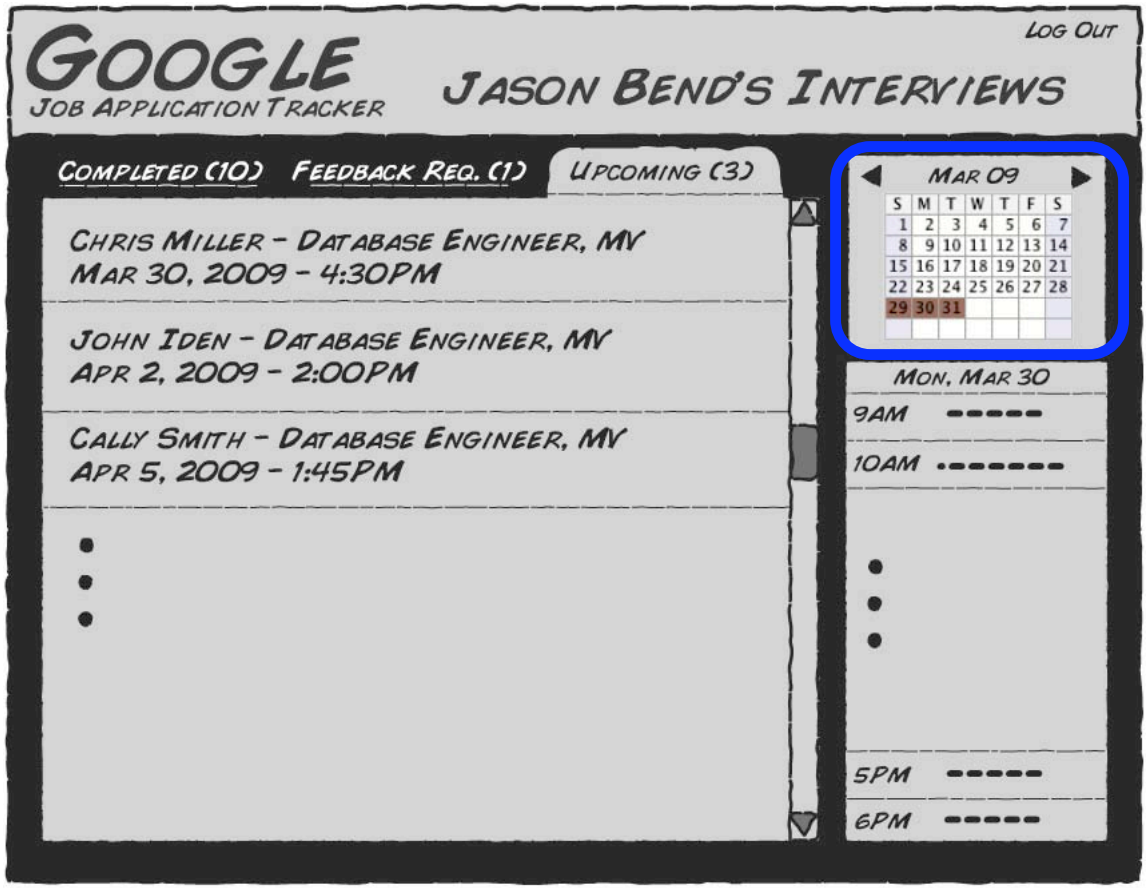
Prepare (View Interview Lists)

Lists



Interviewer-Side Sketches, V3

Prepare (View Interview Lists)



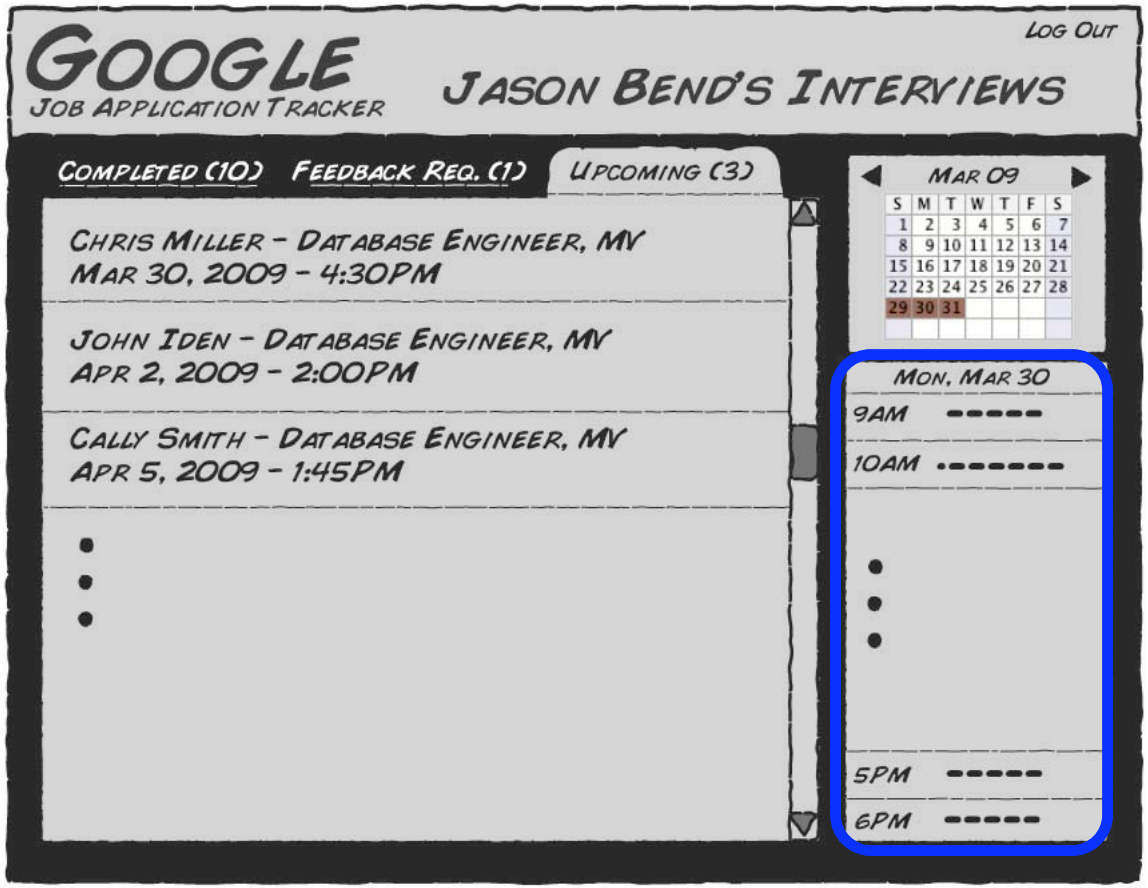
EXPLORE
RELATE
CREATE
EVALUATE

Month/Day Picker

Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

Prepare (View Interview Lists)

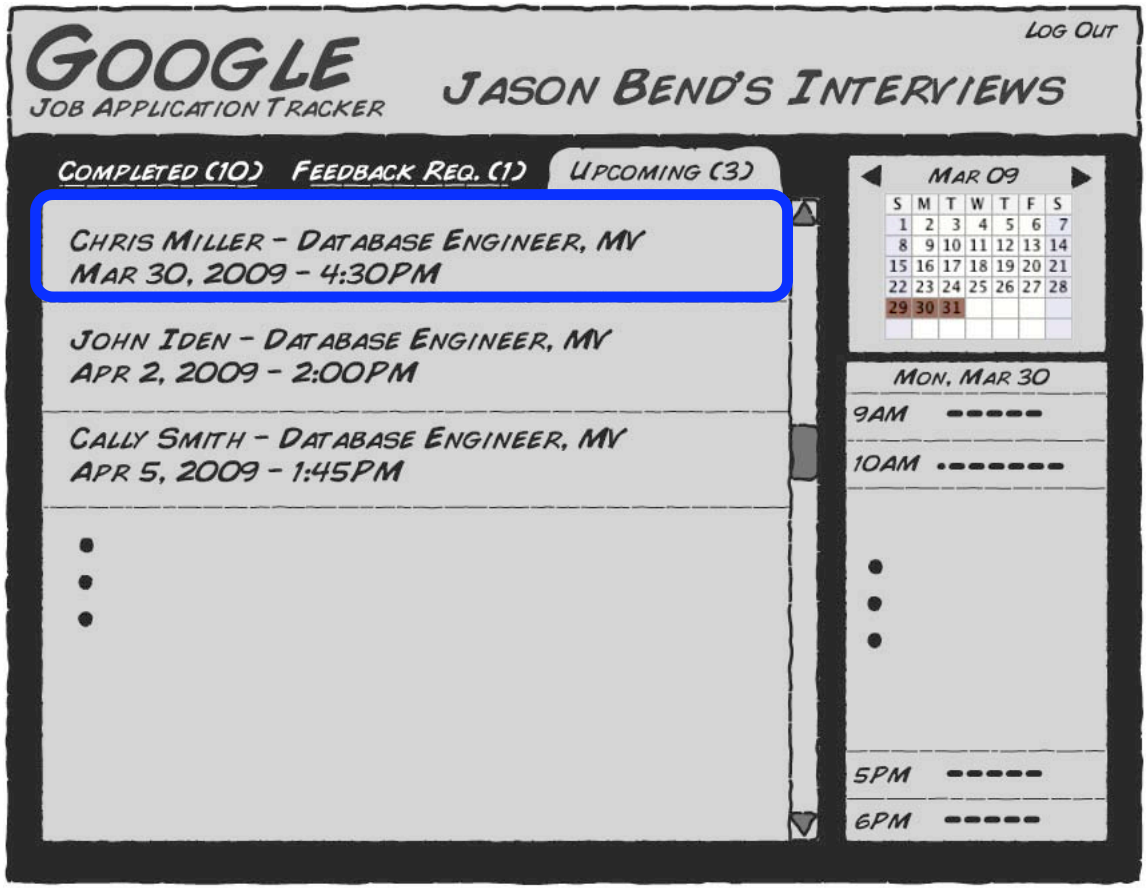


Day Schedule (Busy/Free)

Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

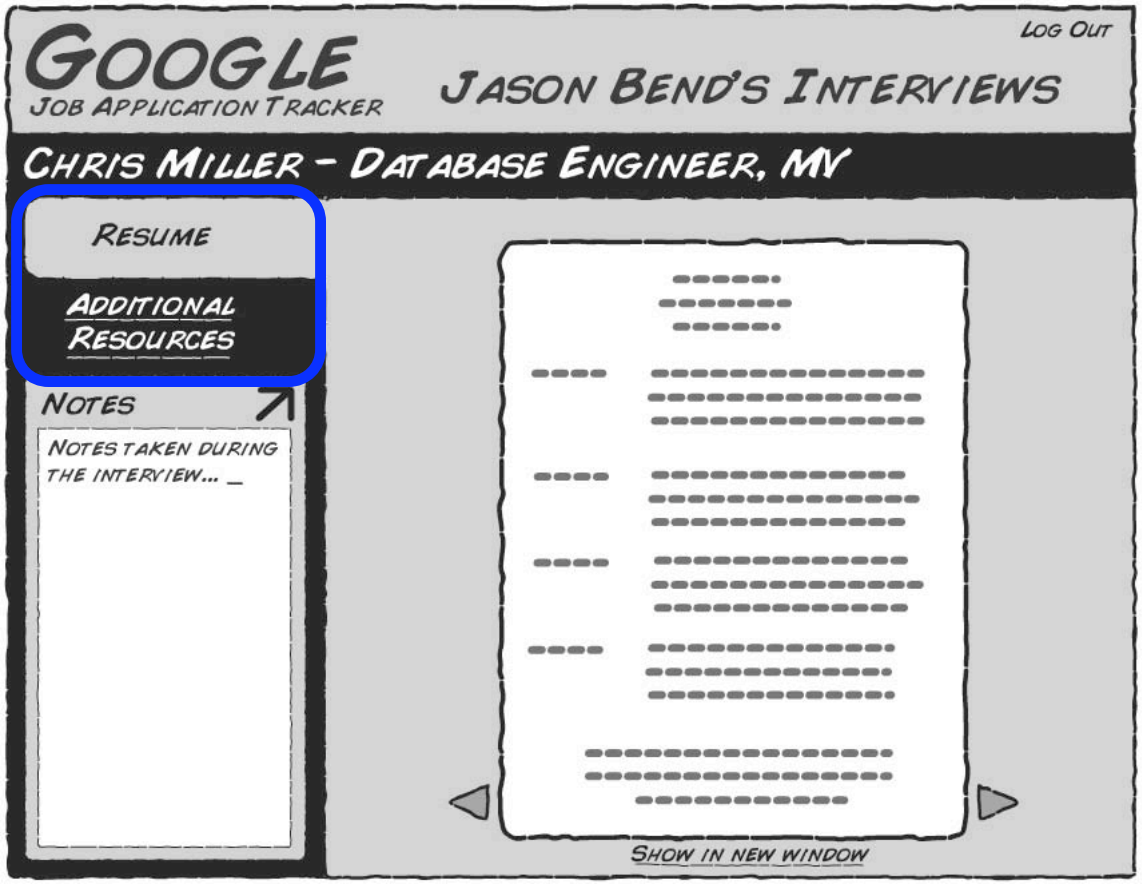
Prepare (View Interview Lists)



Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

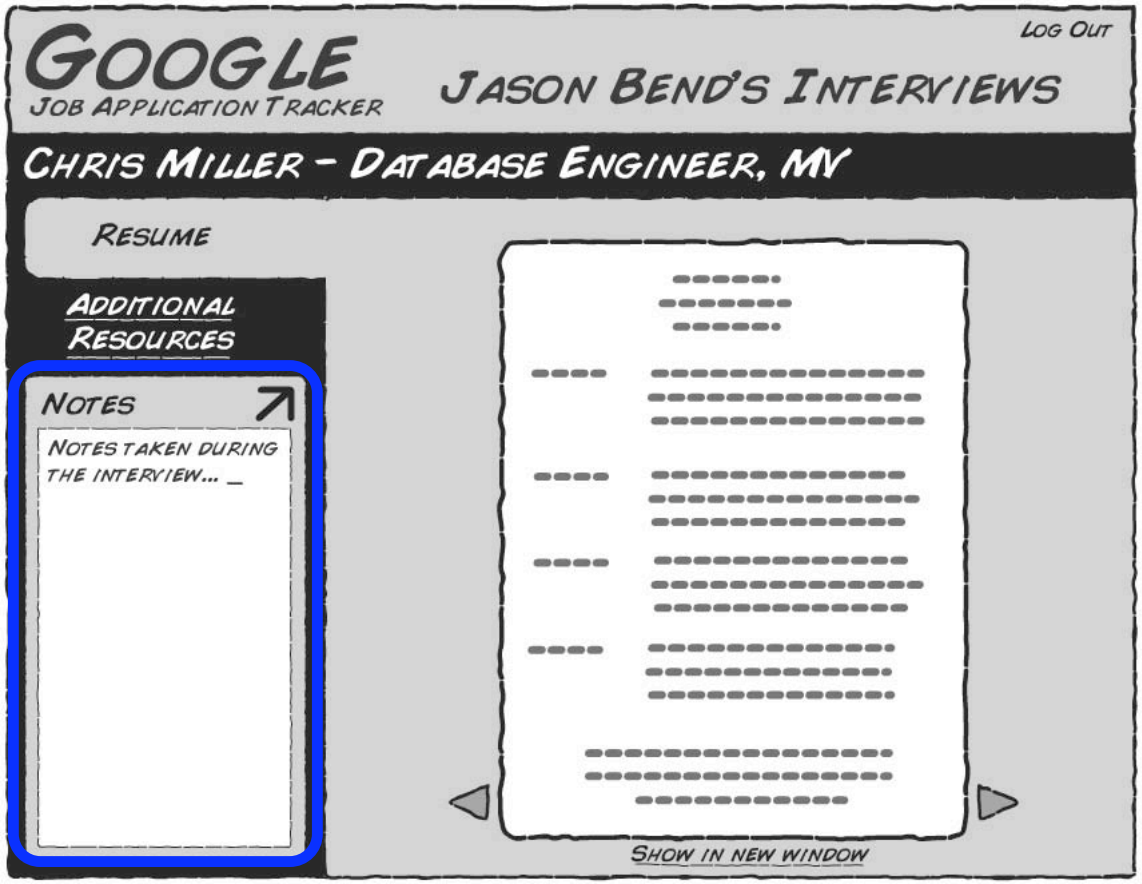
Conduct Interview



Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

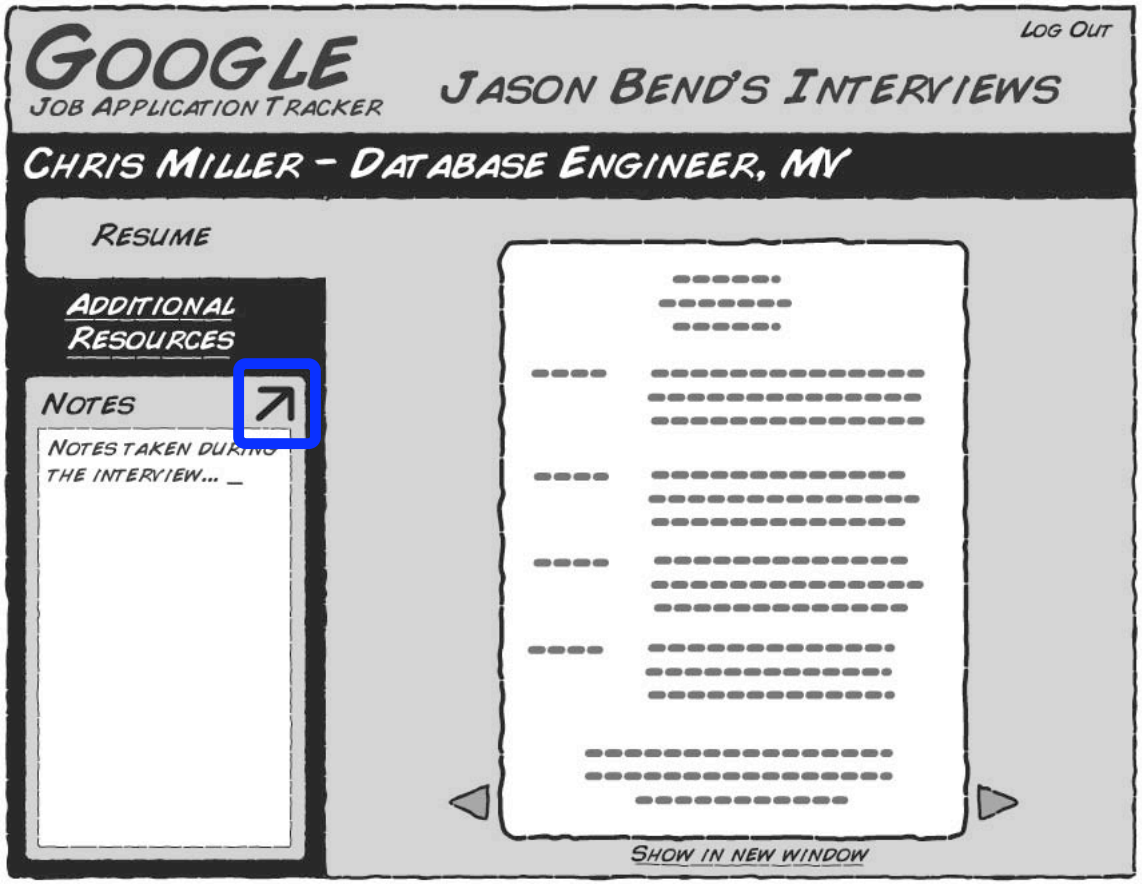
Conduct Interview



Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

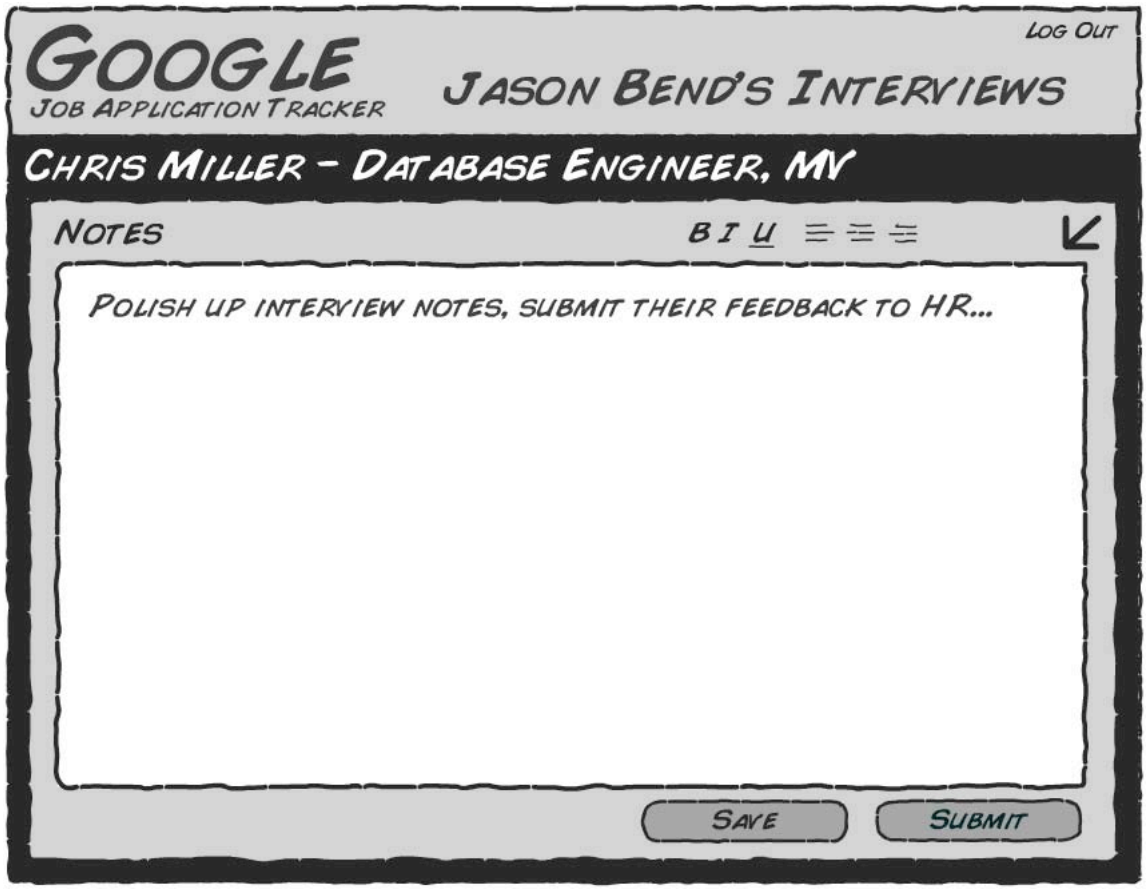
Conduct Interview



Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

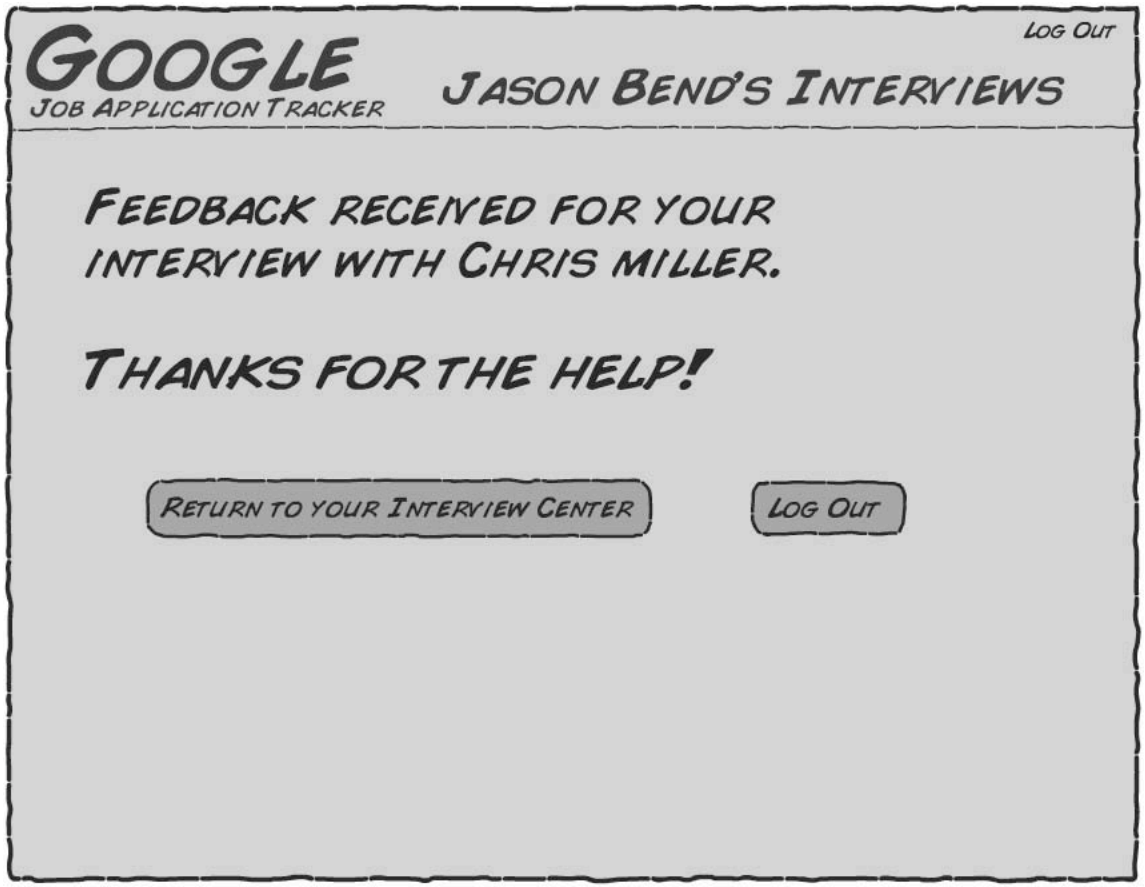
Submit Feedback



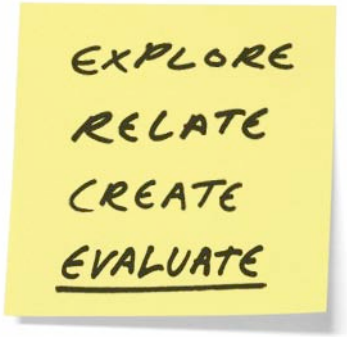
Interviewer-Side Sketches, V3

EXPLORE
RELATE
CREATE
EVALUATE

Receive Confirmation

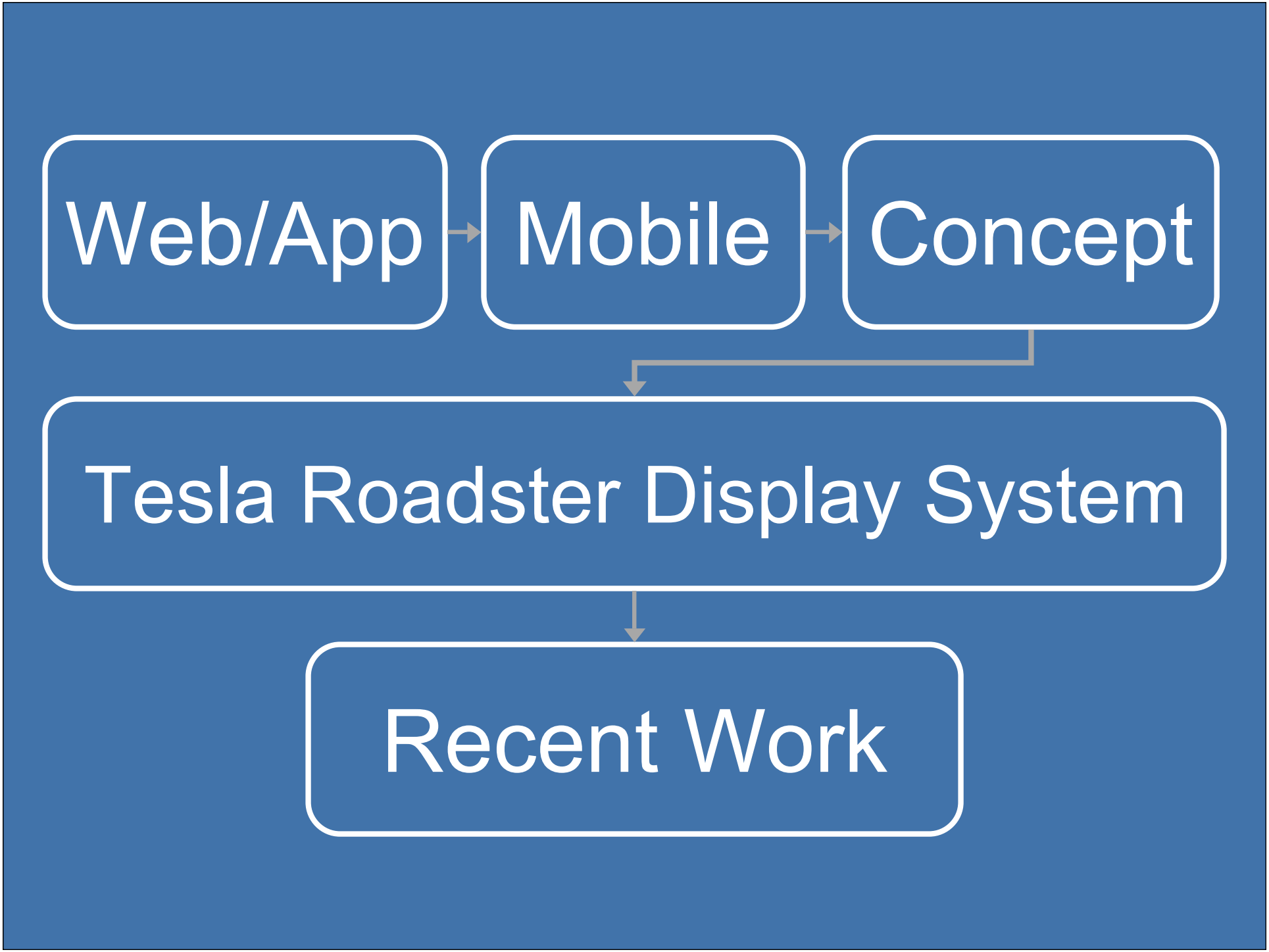


Evaluation



- "Think aloud" study
- Check in with users,
  Informally and frequently

Project Portfolio


Web/App
Mobile
Concept
Tesla Roadster Display System
Recent Work

TA Edge SiteBuilder & Portal

Team: Peter Stanzel, Davy Kitchel,Krispin Leydon

Sites built with SiteBuilder

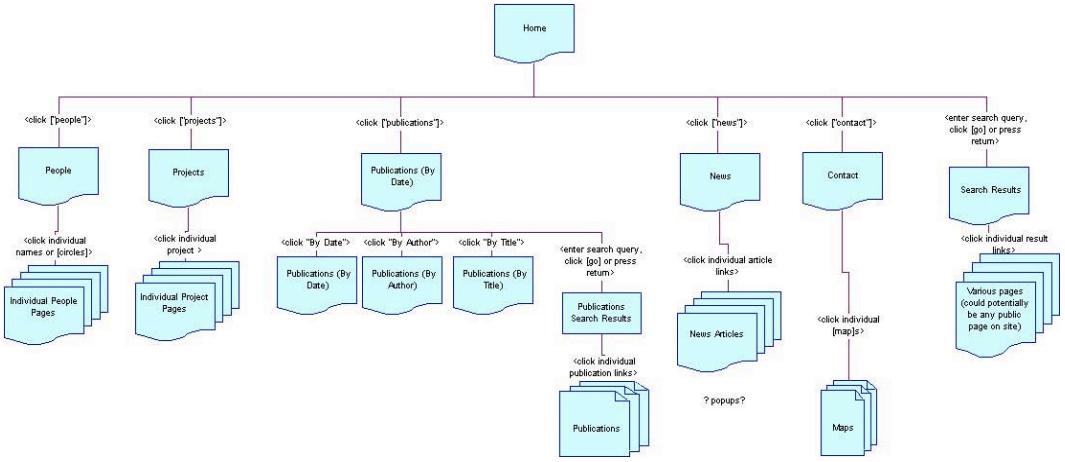
Online Site Builder – American Society of Travel Agents

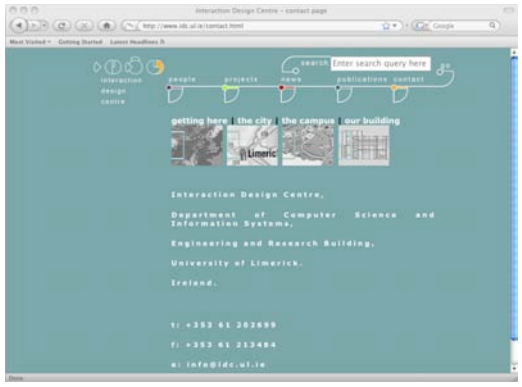
Usability Analysis, Web Design & Development

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Interaction Design Center Web Site

Team: Lisa McElligot, Krispin Leydon, Stephen Hurley, Terrence Hickey, Paul Gallagher, Bruce Richardson





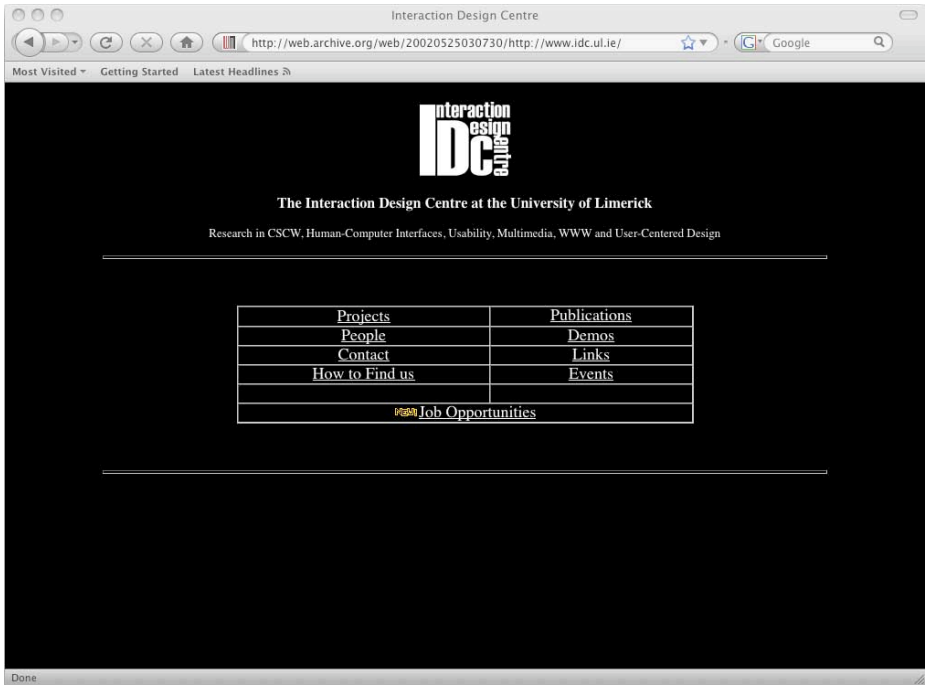
interaction design centre

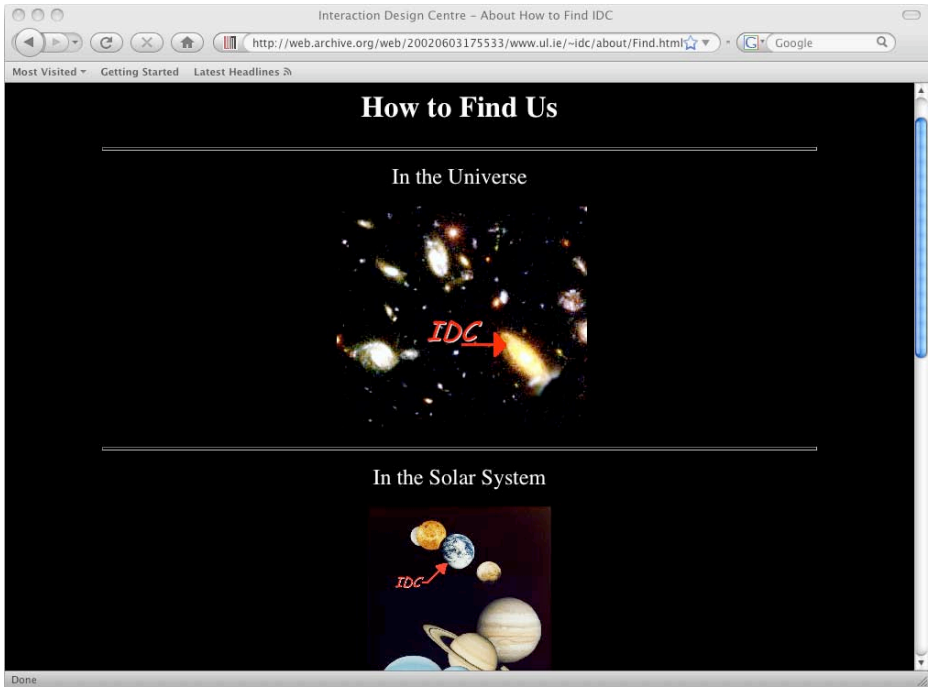
Complete Site Renovation

UX Research, Requirements, IA, Project Management

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Interaction Design Center Web Site



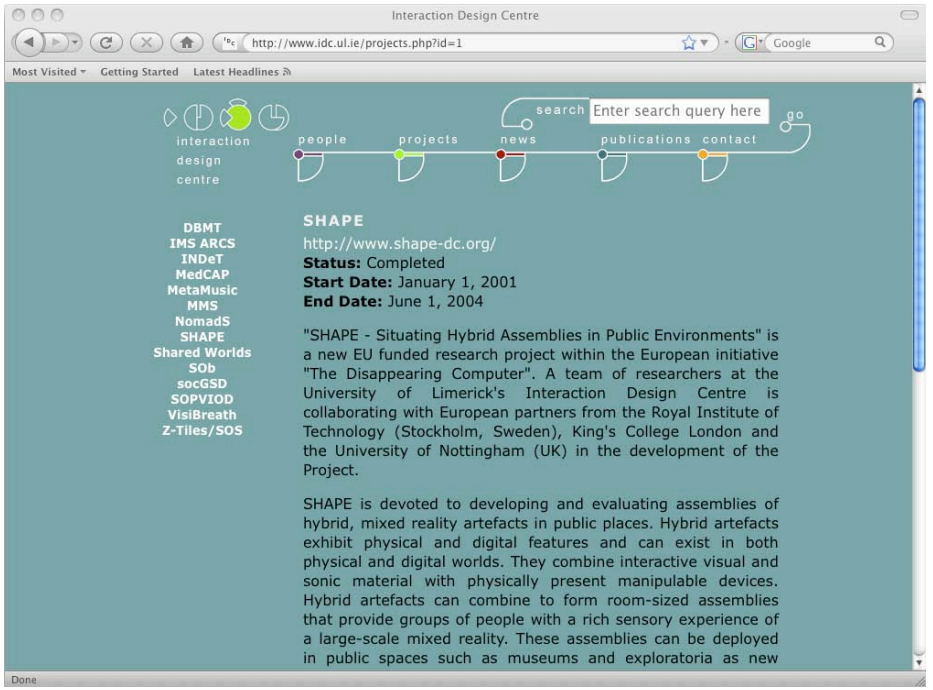


Complete Site Renovation

UX Research, Requirements, IA, Project Management

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Interaction Design Center Web Site



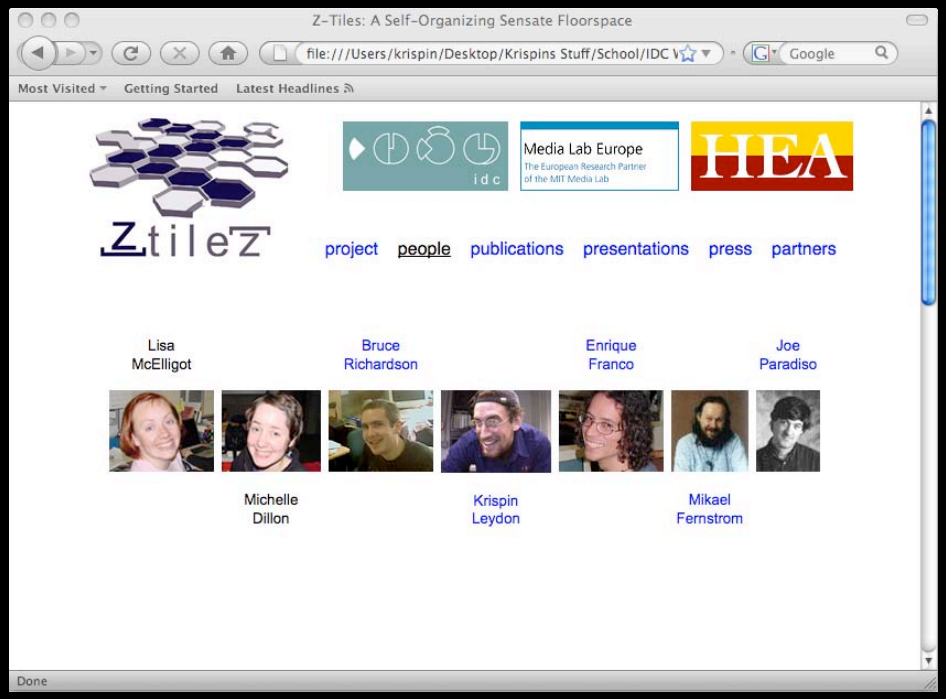
Complete Site Renovation

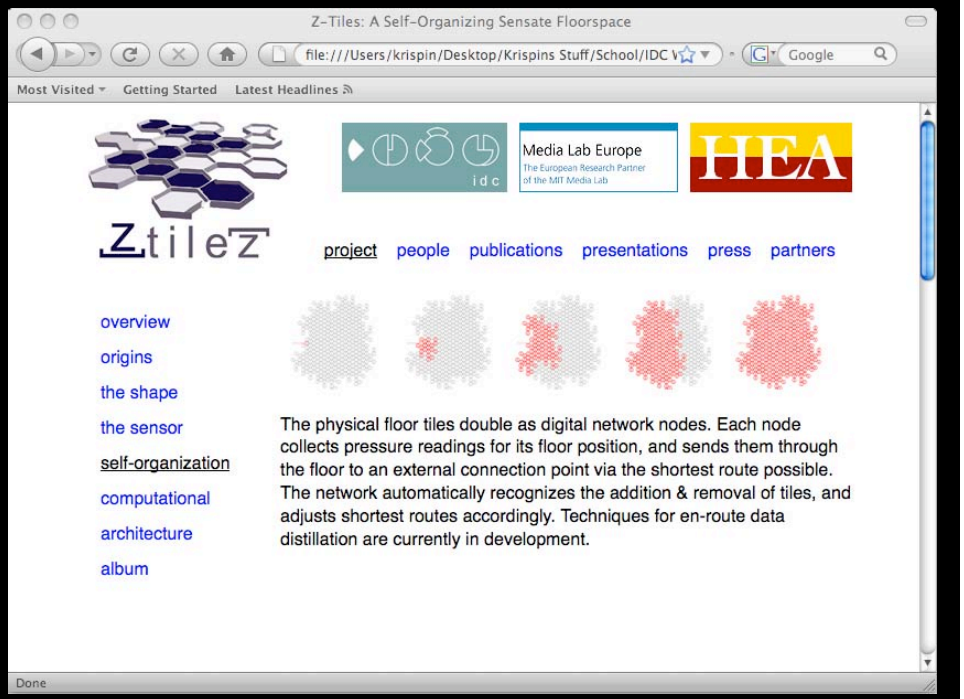
UX Research, Requirements, IA, Project Management

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Research Site

Partners: IDC, MIT, MLE



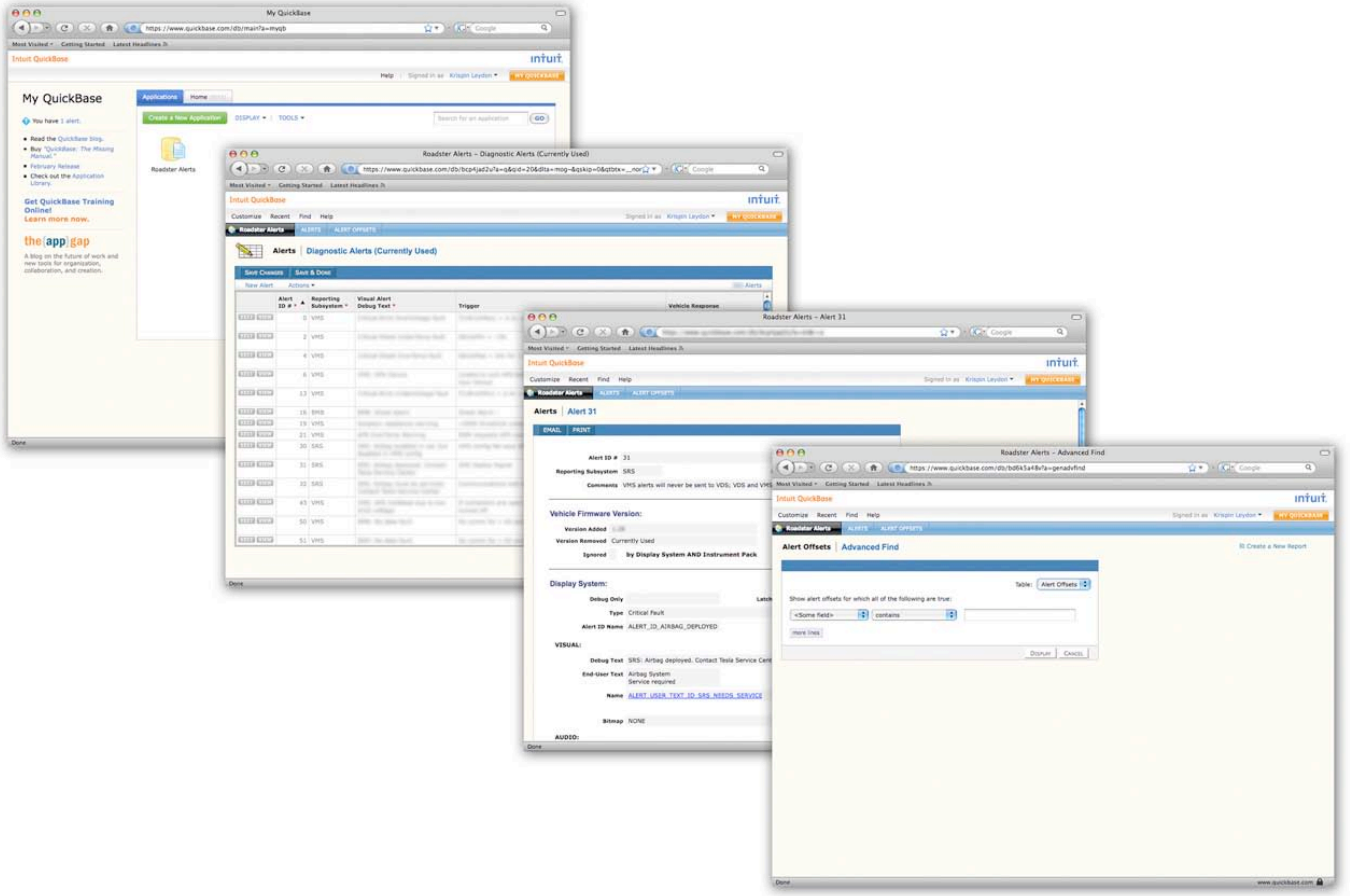


Self-Organizing Sensor Networks Research Collaboration

Web Design & Development

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Automotive Fault Code Database UI



Web Database of Automotive Fault Codes

UI Design (forms & views)

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Field Plot

$$\nabla \cdot \nabla = \left(\frac{\partial}{\partial x}, \frac{\partial}{\partial y}, \frac{\partial}{\partial z}\right) \cdot \left(\frac{\partial}{\partial x}, \frac{\partial}{\partial y}, \frac{\partial}{\partial z}\right) = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} + \frac{\partial^2}{\partial z^2}$$

$$\nabla \cdot (-\kappa \nabla T) = -\kappa \nabla \cdot \nabla T = -\kappa \nabla^2 T$$

$$\iint_S (\nabla \Psi \times \hat{\mathbf{z}}) \cdot d\mathbf{s} = \iint_S \nabla \Psi \cdot (\hat{\mathbf{z}} \times d\mathbf{s}) = \int_A^B \nabla \Psi \cdot d\boldsymbol{\ell}\, \Delta z = (\Psi(B) - \Psi(A))\, \Delta z$$

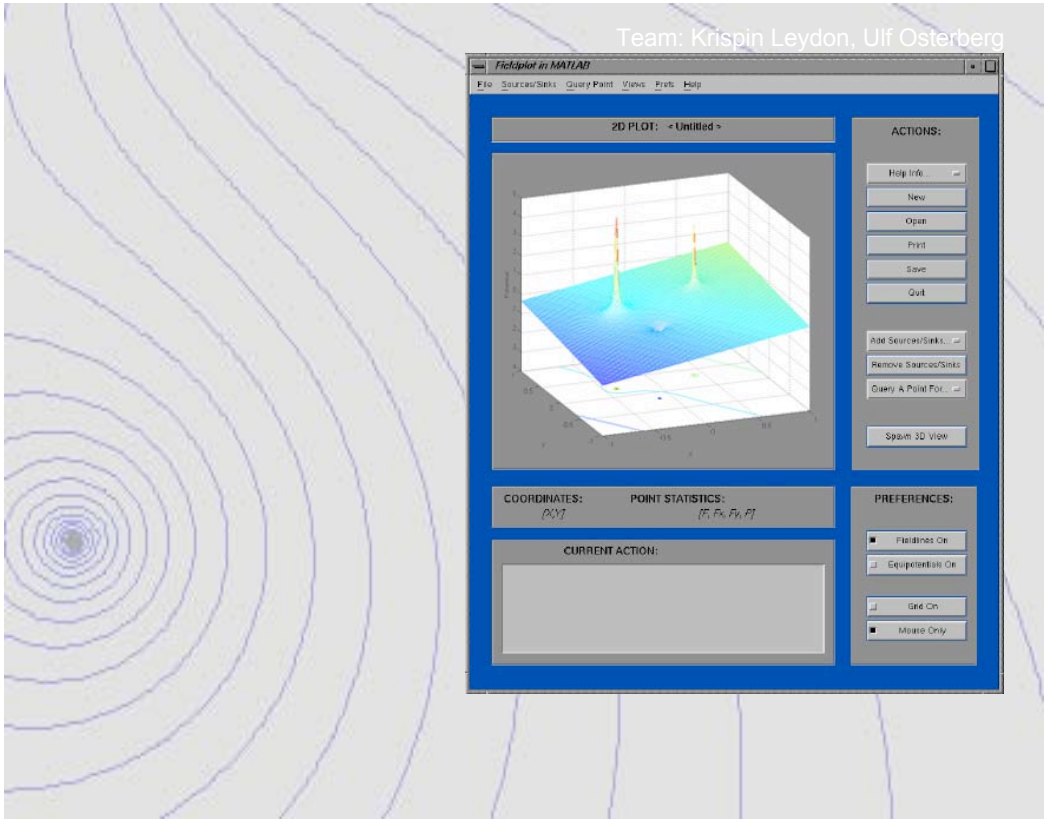
$$\frac{\partial^2 V}{\partial x^2} = -l \frac{\partial}{\partial x} \frac{\partial I}{\partial t} = -l \frac{\partial^2 I}{\partial x \partial t} = -l \frac{\partial^2 I}{\partial t \partial x} = -l \frac{\partial}{\partial t} \frac{\partial I}{\partial x} = -l \frac{\partial}{\partial t} \left(-c \frac{\partial V}{\partial t}\right) = lc \frac{\partial^2 V}{\partial t^2}$$

$$\oiint_{CS} \tilde{\mathbf{v}}_t \cdot d\mathbf{s} = \iiint_{CV} \tilde{f}_a \, dV \qquad \nabla \cdot \tilde{\mathbf{v}}_t = \tilde{f}_a$$

$$\frac{\partial q_x}{\partial x} + \frac{\partial q_y}{\partial y} + \frac{\partial q_z}{\partial z} = \left(\frac{\partial}{\partial x}, \frac{\partial}{\partial y}, \frac{\partial}{\partial z}\right) \cdot (q_x,\ q_y,\ q_z)$$

$$\begin{aligned} \frac{\partial}{\partial t} \rho V c T(x,y,z,t) &= \rho c \Delta x \Delta y \Delta z \frac{\partial T}{\partial t} \\ &= (q_x(x,y,z,t) - q_x(x+\Delta x,y,z,t))\, \Delta y \Delta z \\ &\quad + (q_y(x,y,z,t) - q_y(x,y+\Delta y,z,t))\, \Delta x \Delta z \\ &\quad + (q_z(x,y,z,t) - q_y(x,y,z+\Delta z,t))\, \Delta x \Delta y \end{aligned}$$

$$-\rho c \frac{\partial T}{\partial t} = \frac{q_x(x+\Delta x,y,z,t) - q_x(x,y,z,t)}{\Delta x} + \frac{q_y(x,y+\Delta y,z,t) - q_y(x,y,z,t)}{\Delta y} + \frac{q_z(x,y,z+\Delta z,t) - q_z(x,y,z,t)}{\Delta z}$$

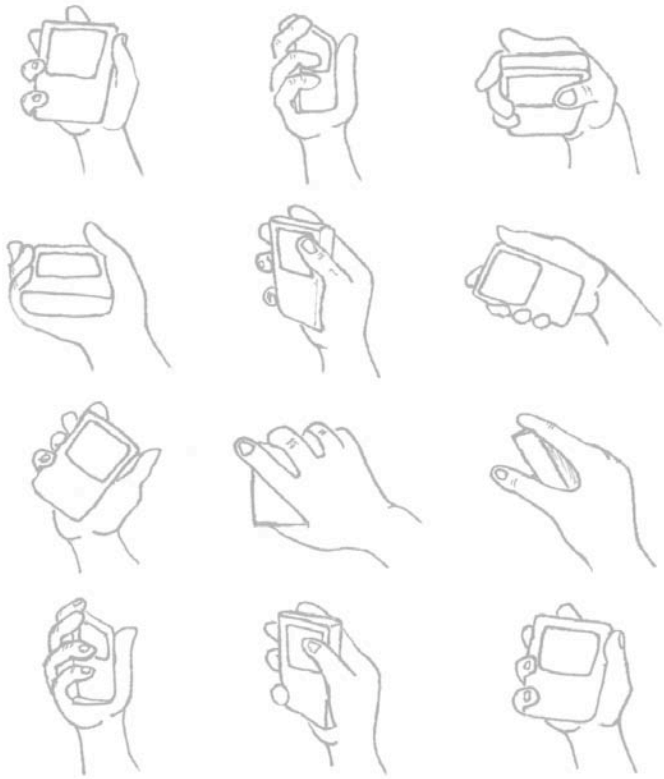


Electric Field Visualization App for Dartmouth College

UI Design & Development

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Accelerometer-Based Gestural Control



Team: Jonas Åkermark, Krispin Leydon, Andrew Jones

ANALOG DEVICES

C.A.B. Engineering Design Prize
Dartmouth College, 2001

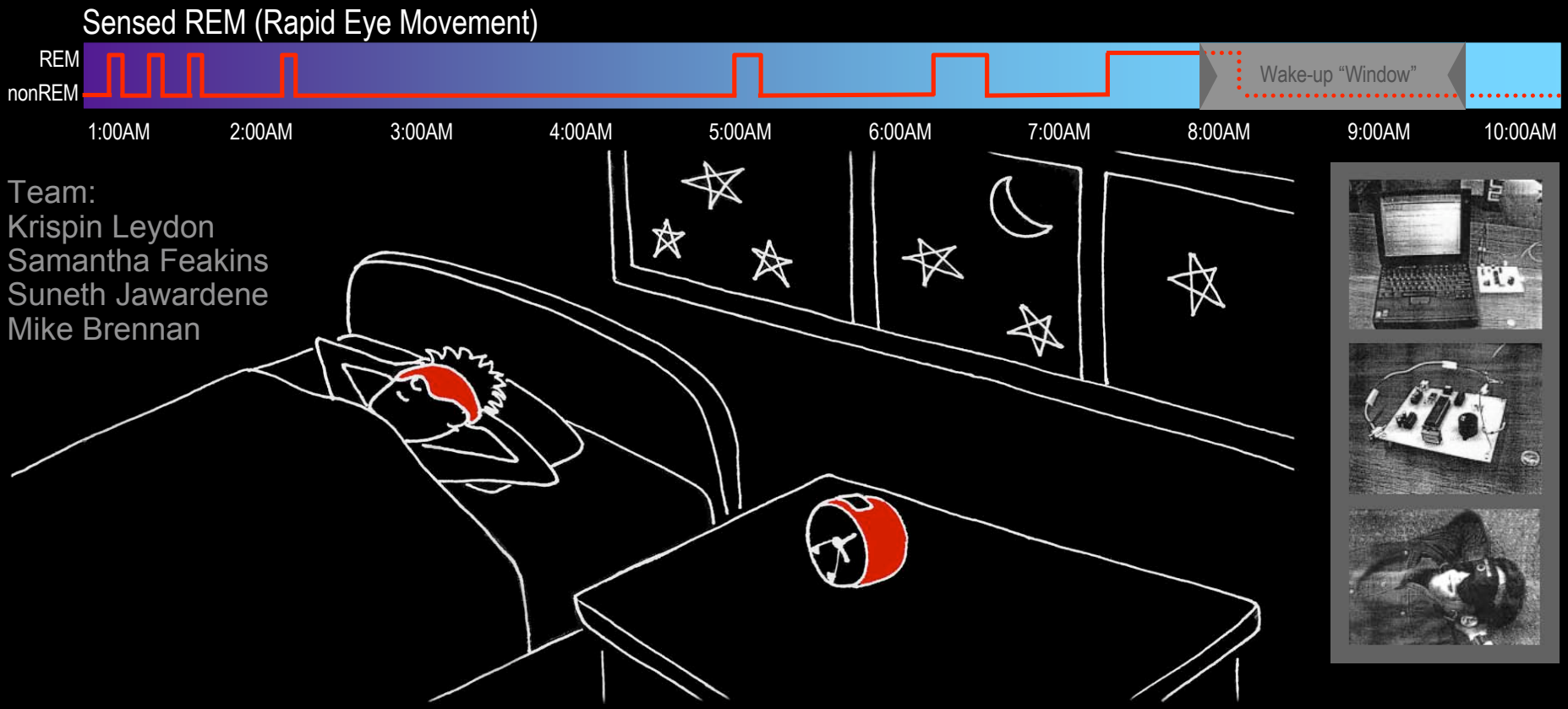
VisiBreath

Asthma Management through Mobile Gaming

Prototyping & 3D Modeling

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

REM-Monitoring Alarm Clock



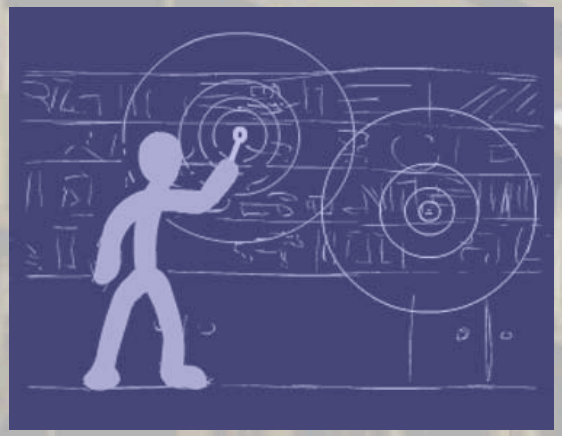
People wake from REM sleep more refreshed & alert...

Is a more sensitive alarm clock possible?

System Development

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Dowsing for Documents



How to bring *Digital* Search to *Physical* Collections?

IBM Research
Invited Talk

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Tesla Roadster Display System

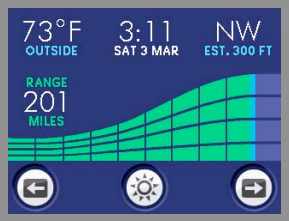
Roadster Recognition

Best Product Design 2007, Ecodesign
BusinessWeek

Best Inventions 2006, Transportation
Time Magazine

Best Car of the Year, 2007
WIRED, Autopia

Breakthrough Award, 2006
Popular Mechanics



Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Tesla Roadster Display System

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Tesla Motors

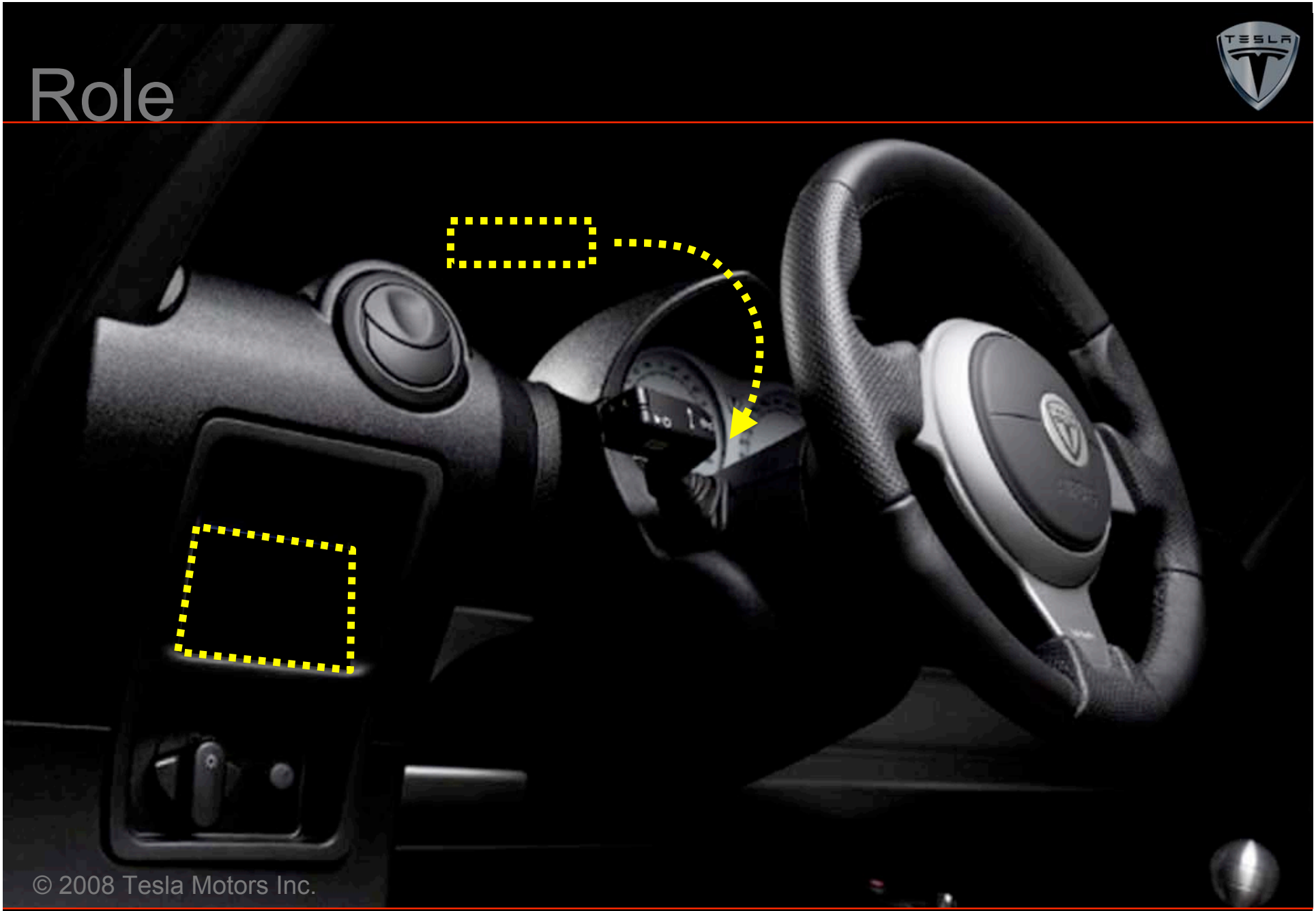
www.teslamotors.com

Tesla Roadster

- 0-60mph in 4 seconds
- 2X the Efficiency of Prius
- Zero emissions
- 220 miles/charge
- < 2 cents/mile

Role

Role



Role

- Sound Effects
- Vehicle Behaviors

Role

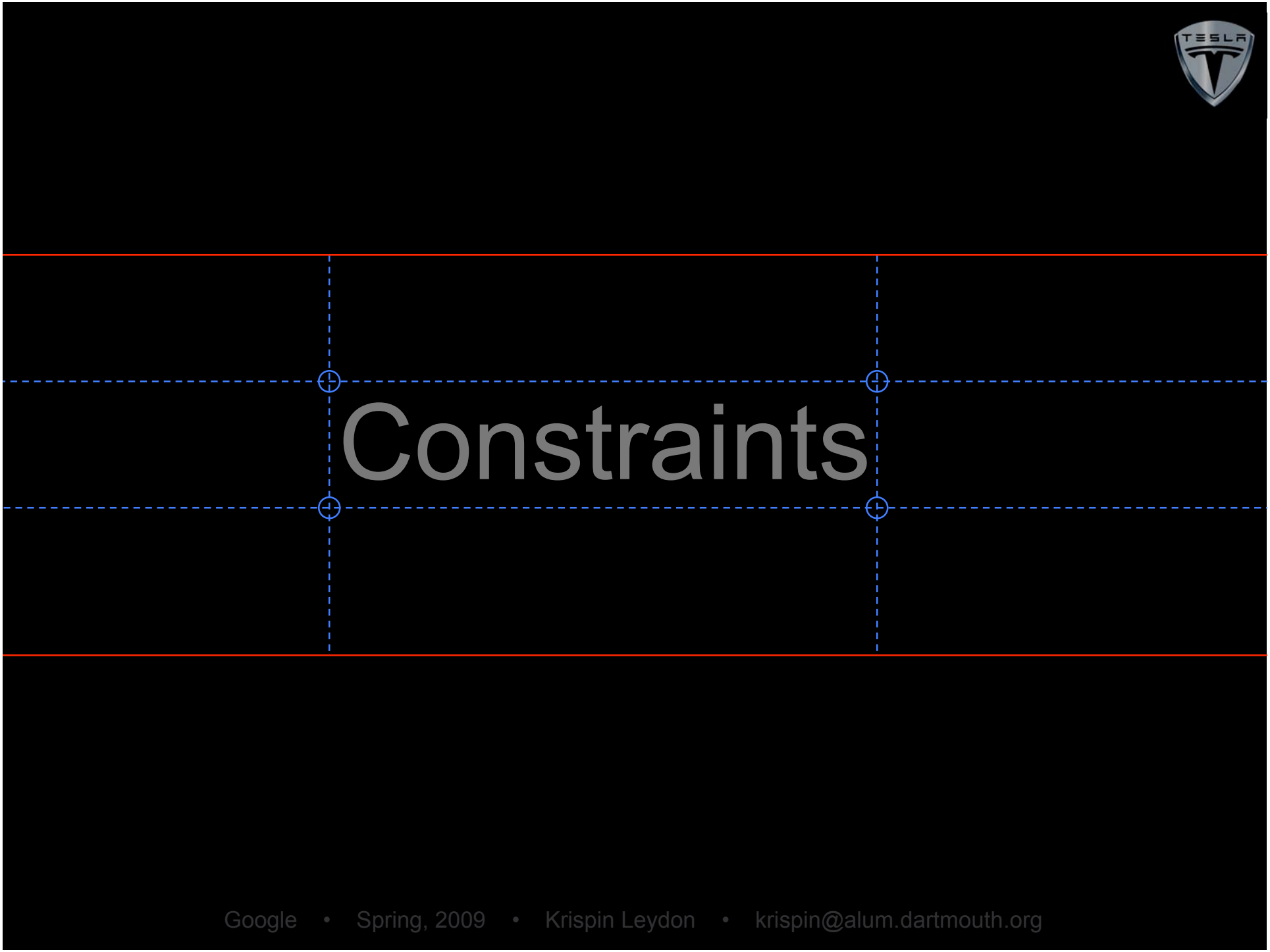
- UX Research
- UI Design Lead
- UI Development

Role

- UX Research
- UI Design Lead
- UI Development
- Coordination

Engineering Teams, VPs, Consultants, Test, Manufacturing, Documentation, Quality, Legal, Marketing

San Carlos, Michigan; U.K, South Africa


Constraints

Constraints

No WYSIWYG.

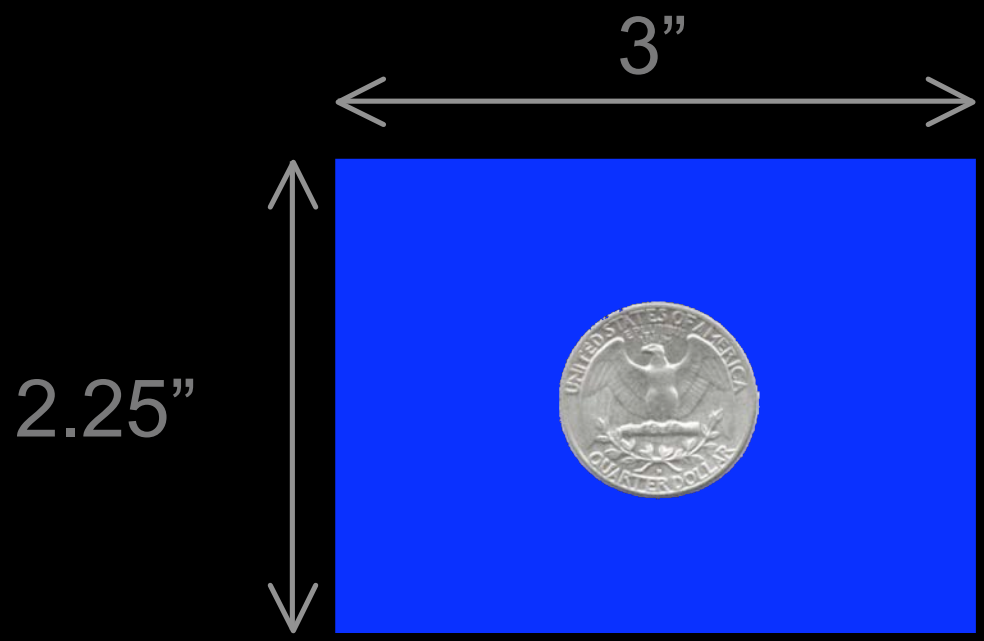
No OS.

No Anti-Aliasing.

256 Colors,

10bit, 8kHz Mono Sound.

Constraints



Screen Size

Constraints

Emergency Extra Range Mode
Pin-Locked Mode
Valet Mode
Display On/Off
Day/Night Mode
Headlight-Dependent Darkening
Ice warning
Traction Control On/Off
Tire Pressures/Temperatures
Doors/Trunk Open
Garage Door Openers
Places I've Charged Before
Miles from Home
Miles to Next Service
Odometer Value
Time
Date
Estimated Range
Elevation
Latitude
Directional Heading
Car Info
Help
Drive Data Full

Longitude
Cabin temperature
Outside Temperature
Inst. Torque
Inst. Horsepower
Inst. Acceleration
0-60 time
Lap timer
Instantaneous Efficiency
Inst. Equiv Miles Per Gallon
Instantaneous Energy to/from Battery
Energy consumed (cumulative)
Barrels of oil saved (cumulative)
Distance (Trip)
Energy Consumed (Trip
Average Efficiency (Trip)
Braking Energy Recovered (Trip)
Distance (Since Charging)
Average Efficiency (Since Charging)
Energy Regened (Since Charging)
Energy Consumed (Since Charging)
Privacy Level Indicator
Motor Temperature
Battery Voltage
Battery Temperature

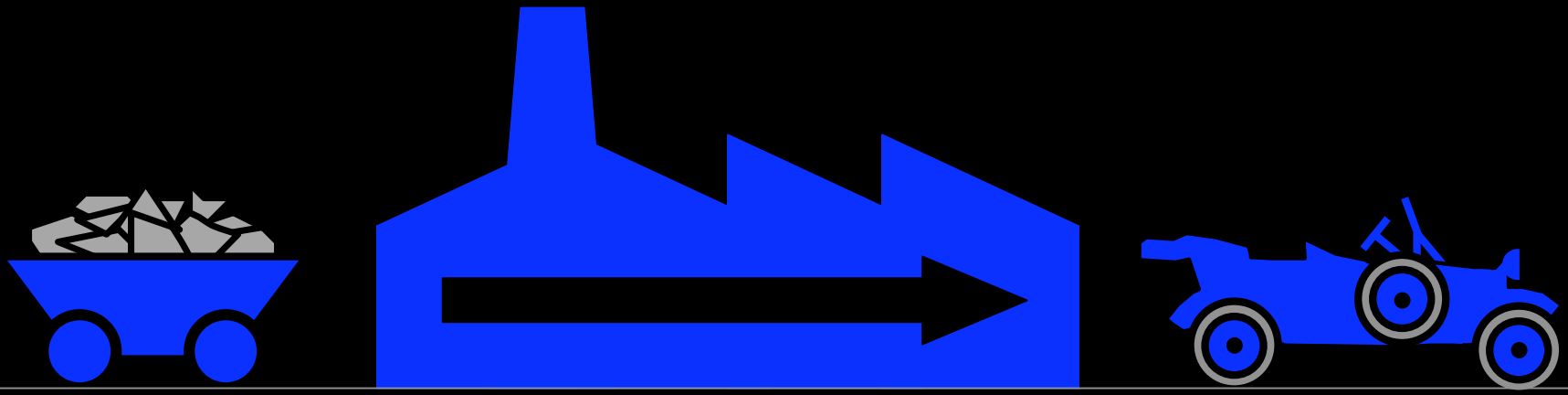
Absolute State of Charge (kWh)
% State of Charge (Battery Bar)
Low Battery Indicator
Cost of Charging
Time-of-Day Charging
Time Left for Full Charge
Duration of Charging Session So Far
Duration of Last Charge Session
kWh of Charge Session So Far
kWh Left Until Fully Charged
Cost of Charging Session so Far
Final Cost of Charging Session
Charging Method
Charging Current
Charging Voltage
Charging Method
Trunk Openings
Unlock Attempts

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

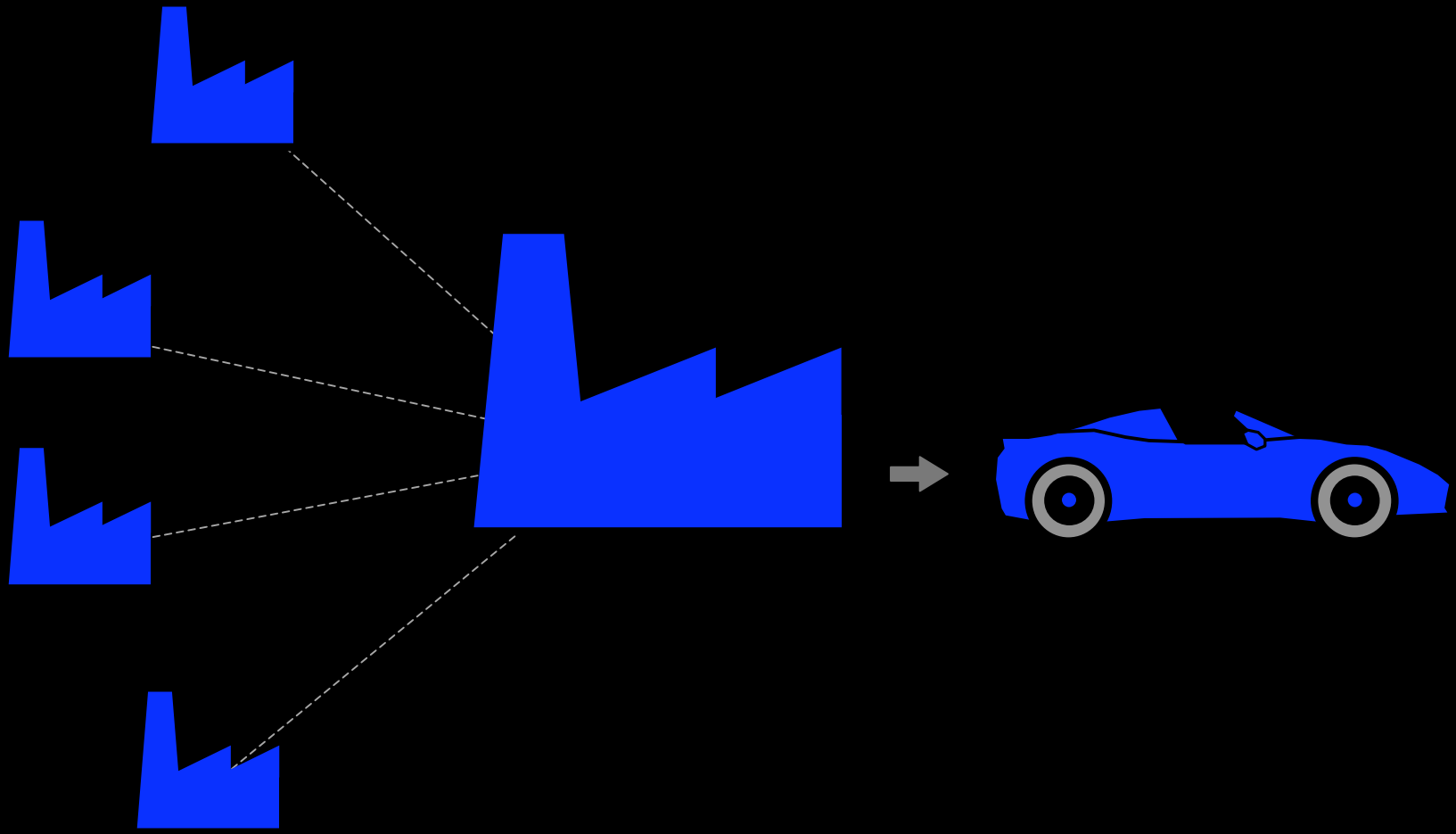
Constraints

Constraints

Constraints



Constraints



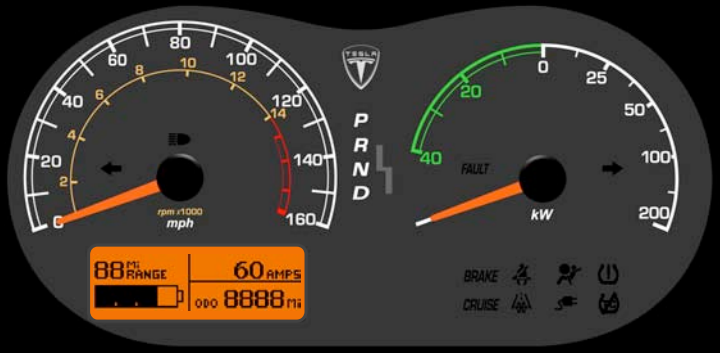
Constraints

UX “Fragmentation”

Constraints

Constraints

Instrument Cluster



G Meter*

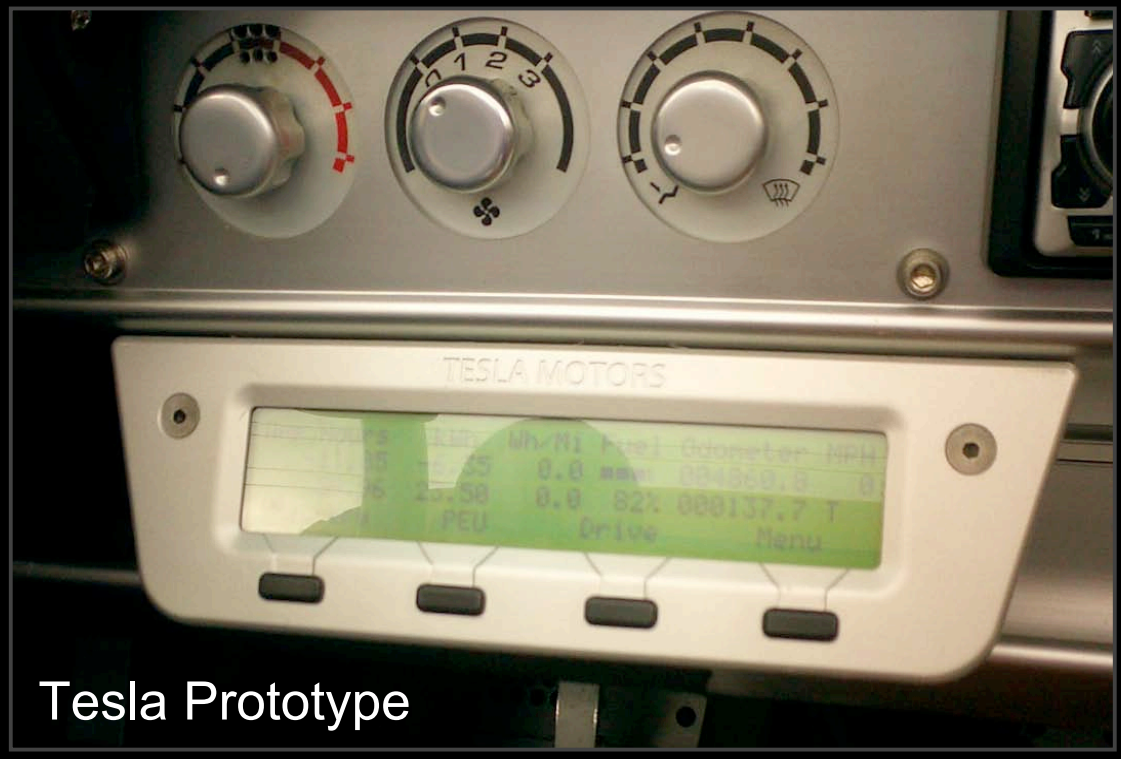
Display

Stereo

Nav System*

*aftermarket

Constraints



Visibility, Contrast, Reflection

Constraints

Aging Eyes & Colorblindness

Constraints

Glance-able at 125mph

Outline

~ 90 Screens

- Driving
- Charging
- Settings & Info
- Diagnostics
- Alerts

Focus

~ 90 Screens

- Driving
- Charging
- Settings & Info
- Diagnostics
- Alerts

Who are our drivers?

Drivers: Developers

Drivers: Developers

Drivers

Sports Car Enthusiasts

Driving as sport,
not just transportation. Individualistic, risk-taking.
Up on car stats.

Drawn by performance. Status from having a cool car.

Performance stats for bragging rights - and honing skills.
Crave feel for the road more than amenities.

Drivers

Techies

Early adopters

Excited to see a silicon valley car

Status from mastering the newest thing first

Configurability, details & data to chew on.

Real (non-condescending) info on how car works.

Drivers

Green “Cultural Creatives”

Cause driven, focused on ecological impact.
Out to prove green values & profitability *not* mutually exclusive. Idealize life “off the grid”.

High efficiency, low emissions - w/o loss of sex appeal.
Green moral superiority

Simplicity, lack of clutter. Confirmation they are “doing good” in the world.

Drivers

Neo-Con Oil Isolationists

Pragmatic, nationalistic. View dangers of oil dependence chiefly in economic and political terms.

Drawn by desire to achieve “Energy Independence” (and support an American car company) for national security.

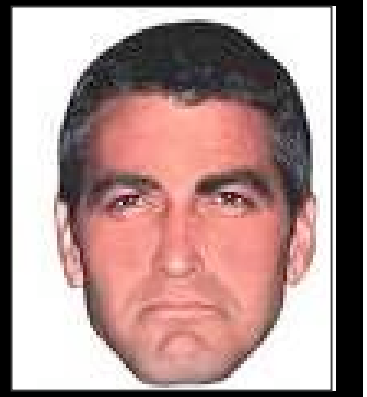
Seek confirmation of US independence from foreign oil.

Drivers



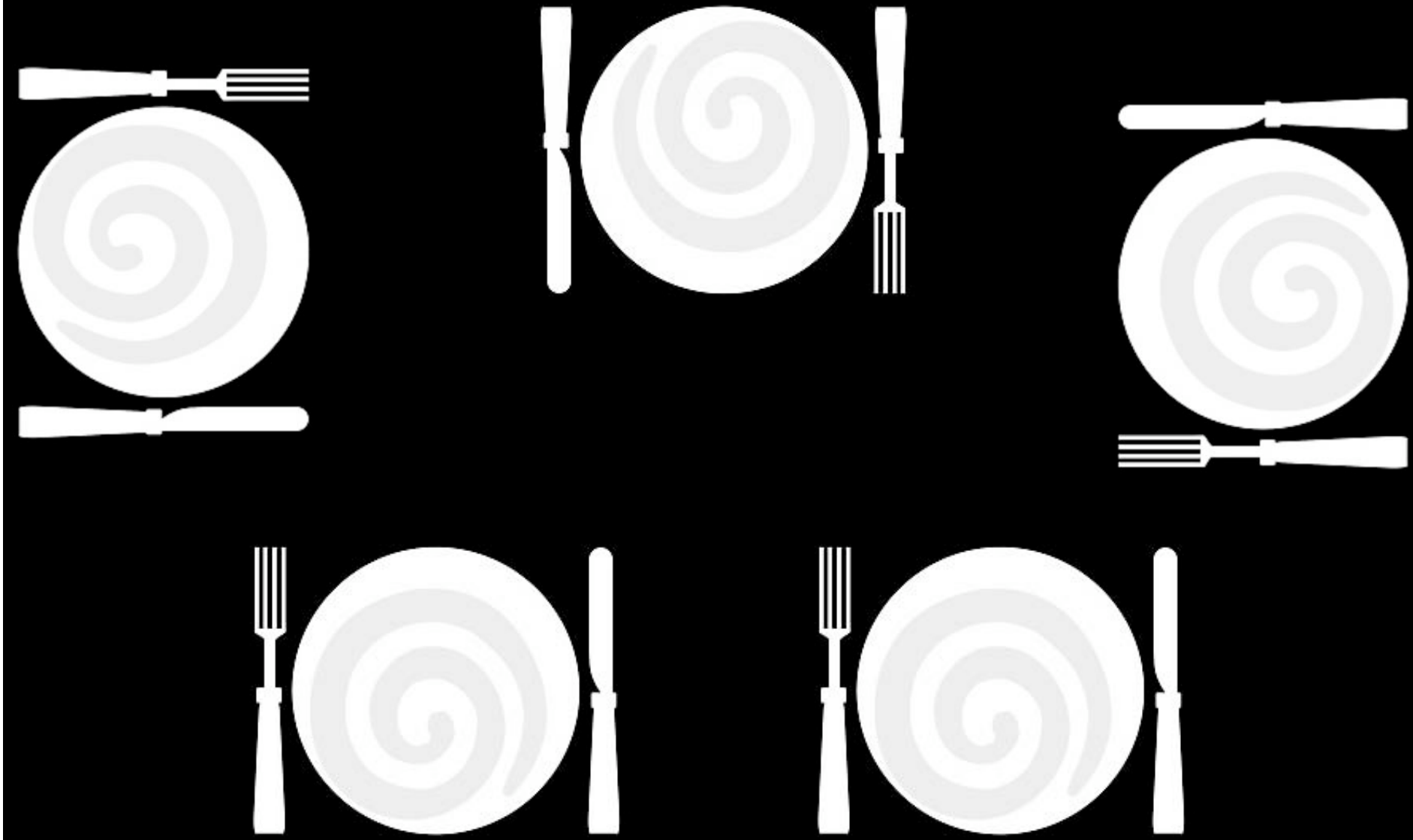




In common: Affluent, Educated, Independent, Mostly Male

How to Serve?



How to Serve?

How to Serve?

How to Serve?

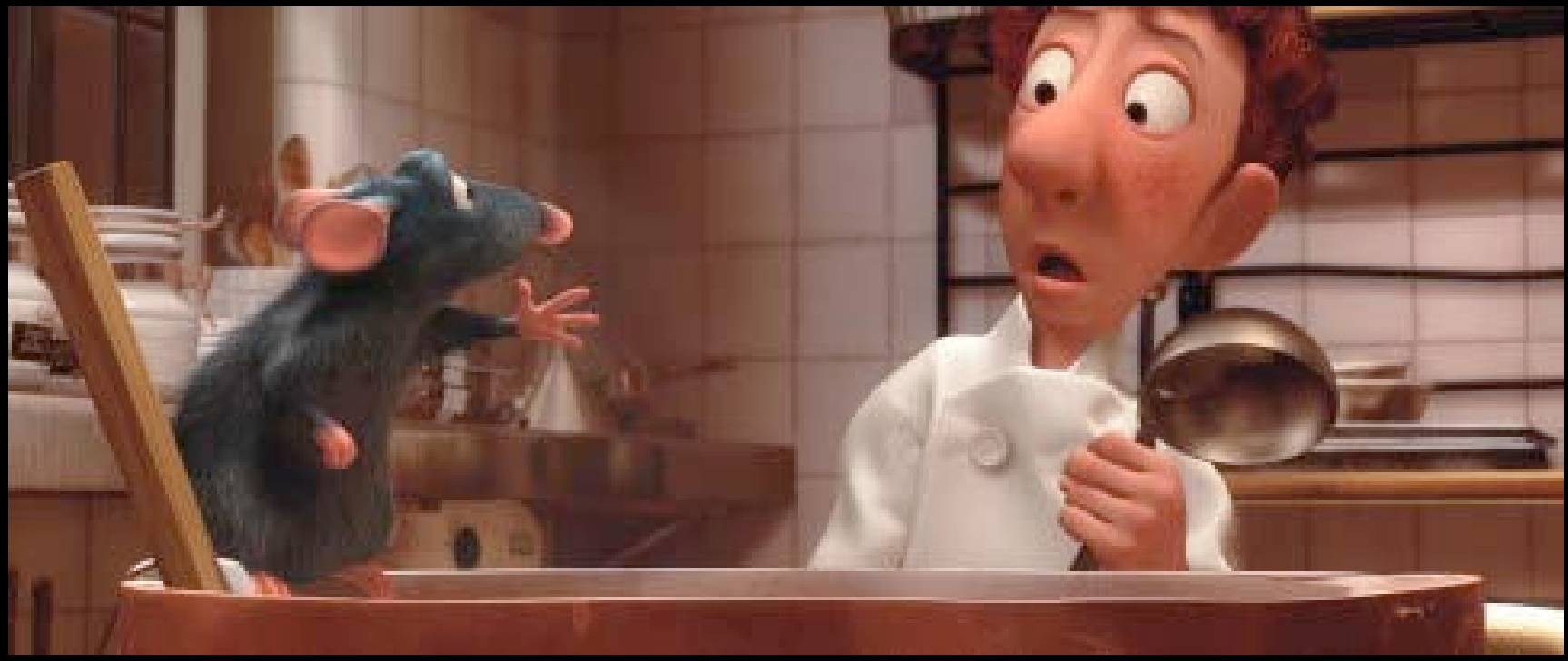
How to Serve?

How to Serve?

How to Serve?

???

How to Cook?



© PIXAR

User Research

Interviews

User Research

Interviews

EV & Hybrid Test Drives

User Research

Interviews

EV & Hybrid Test Drives

Dealership Visits

User Research

Interviews

EV & Hybrid Test Drives

Dealership Visits

…

Card Sorting Exercise

User Research

Interviews

EV & Hybrid Test Drives

Dealership Visits

…

Card Sorting Exercise

Prioritize Features, Group Information

Card Sorting Exercise

Card Sorting Exercise

Card Sorting Exercise

Card Sorting Exercise

Card Sorting Exercise

Findings

Primary Information:

- Estimated Range
- Battery's Charge Level

Findings

Primary Information:

- Estimated Range
- Battery's Charge Level
- Instantaneous Energy to/from Battery

Findings

Primary Categories:

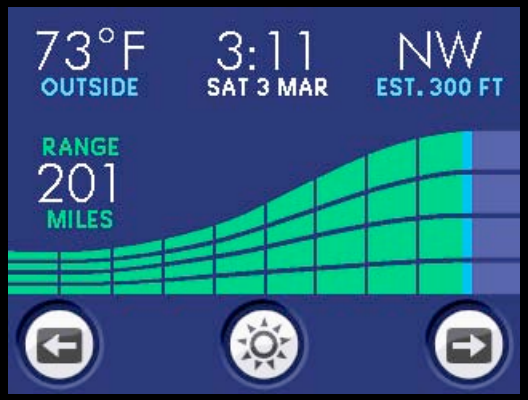
- Energy
- Performance
- Trip
- “Standard”

Findings

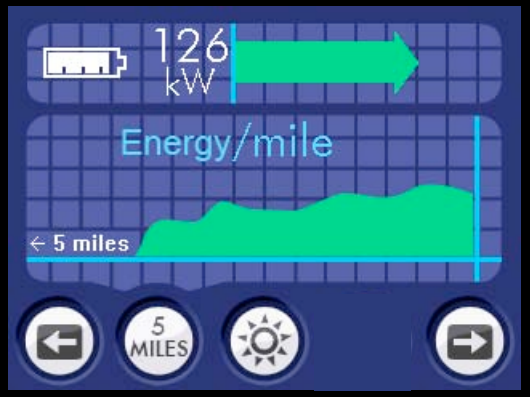
Primary Categories:

- Energy ---------- Greens
- Performance ---- Gear Heads
- Trip ---------- Techies
- “Standard” ------ Common Denom.

Driving Screens



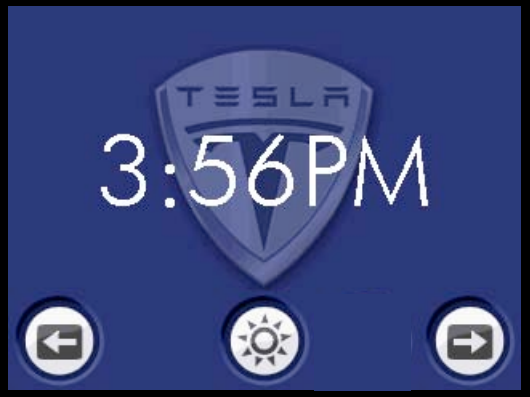
Standard



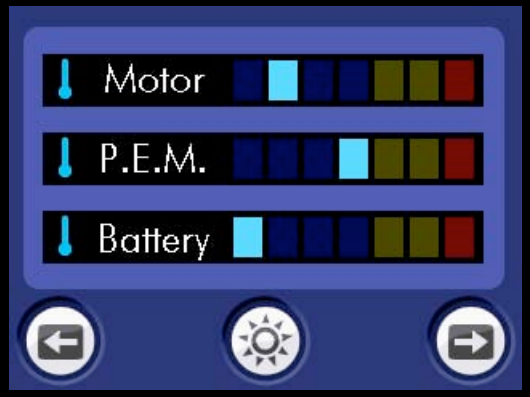
Energy

Trip

Performance

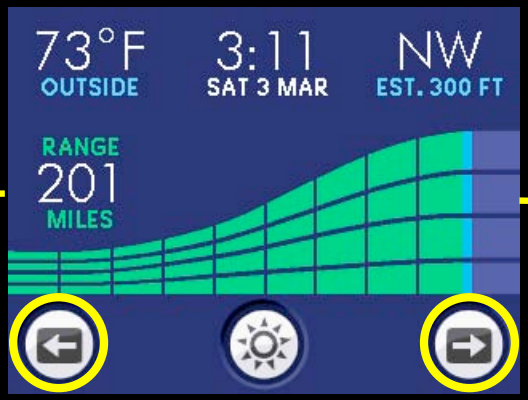


Clock



Vitals

Driving Screens



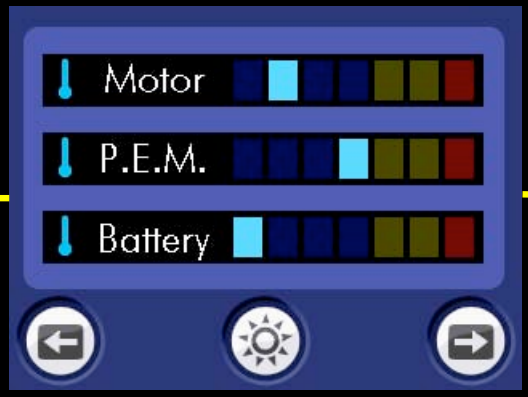
Standard

Energy

Trip

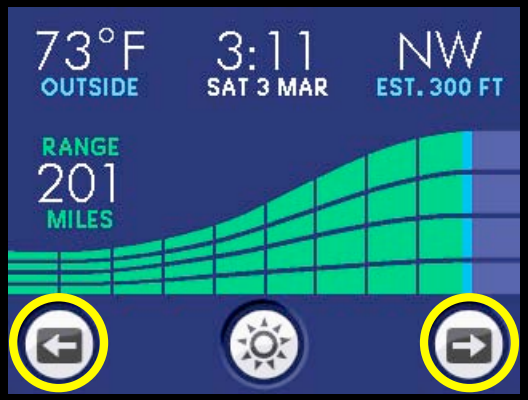
Performance

Clock

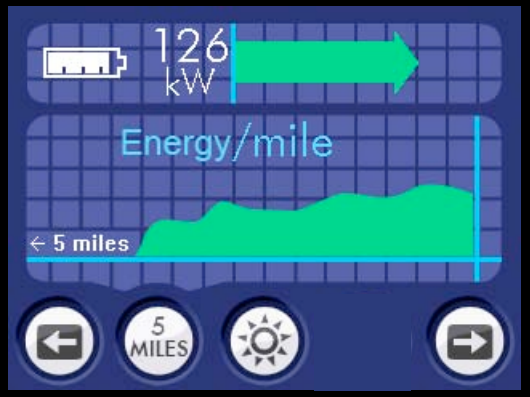


Vitals

Driving Screens



Standard

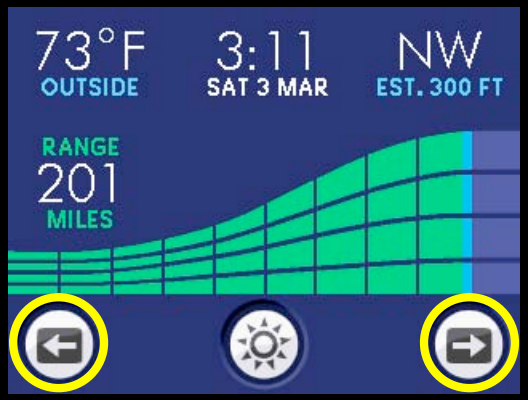


Energy

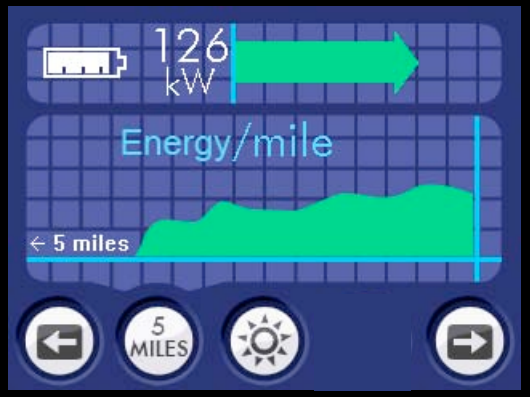
Trip

Performance

Driving Screens



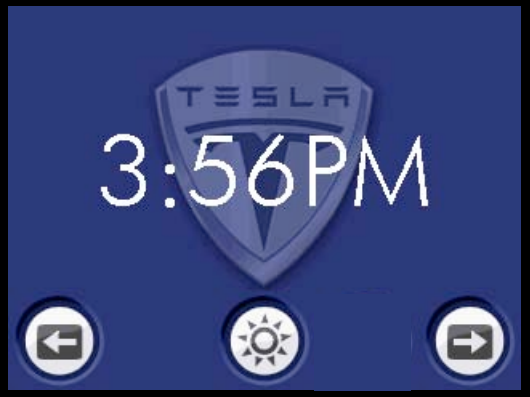
Standard



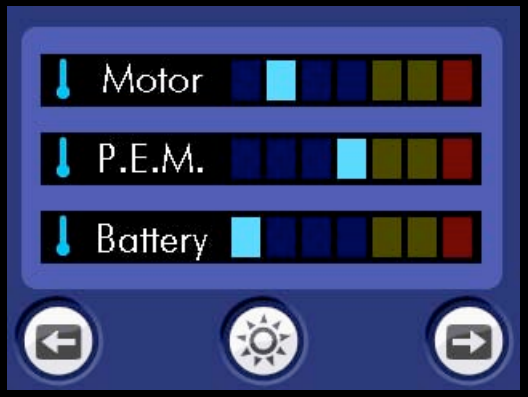
Energy

Trip

Performance

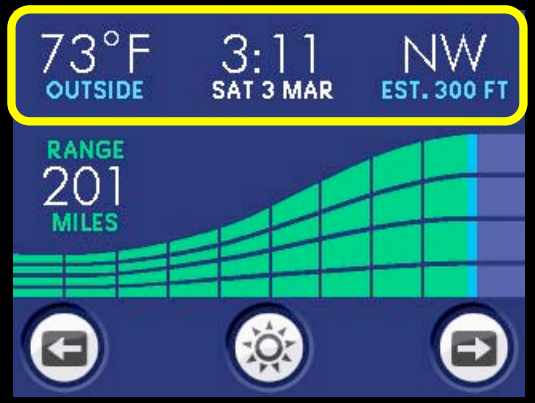


Clock

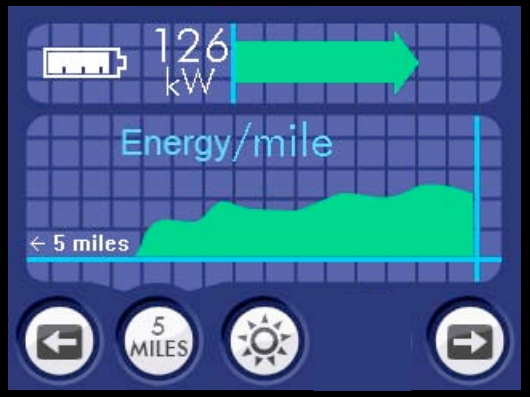


Vitals

Driving Screens



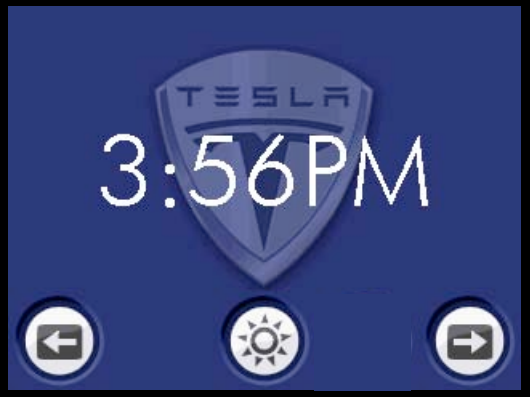
Standard



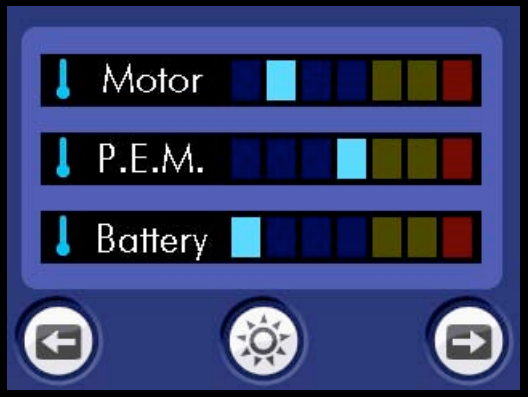
Energy

Trip

Performance

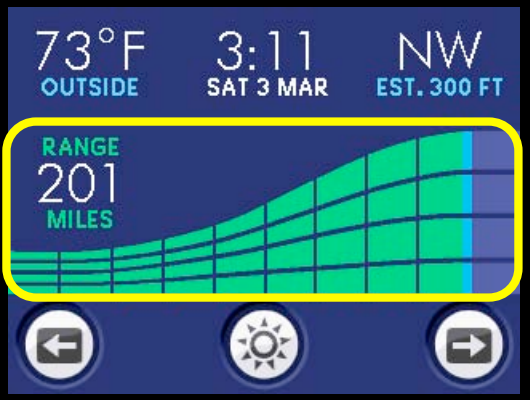


Clock

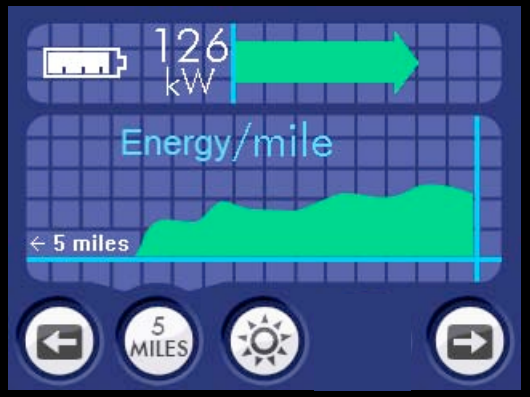


Vitals

Driving Screens



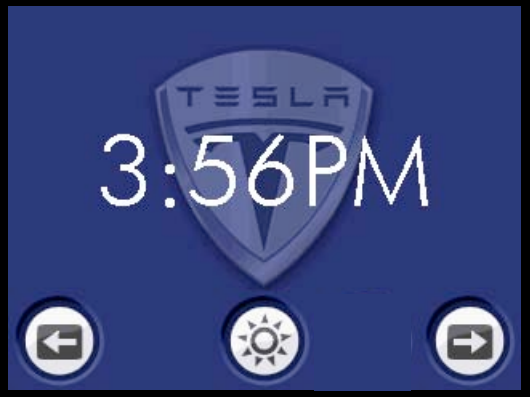
Standard



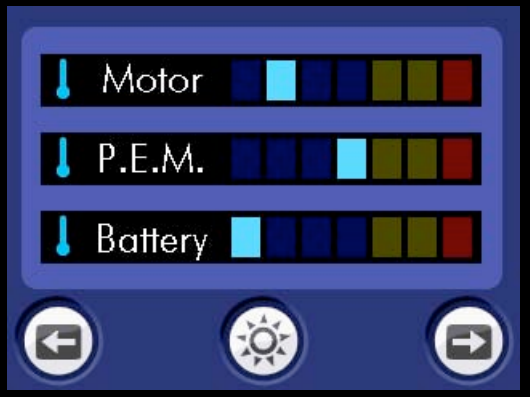
Energy

Trip

Performance

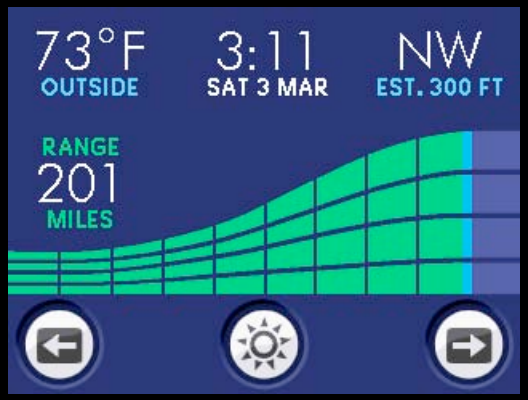


Clock



Vitals

Driving Screens



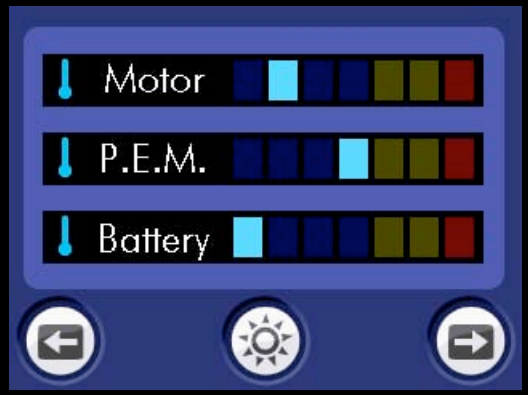
Standard

Energy

Trip

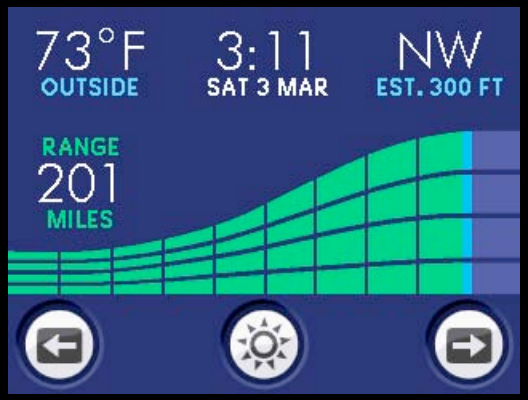
Performance

Clock

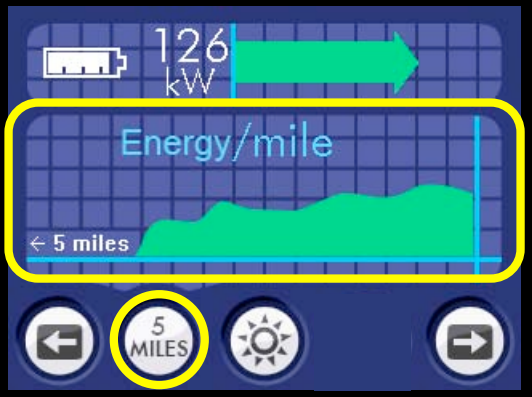


Vitals

Driving Screens



Standard

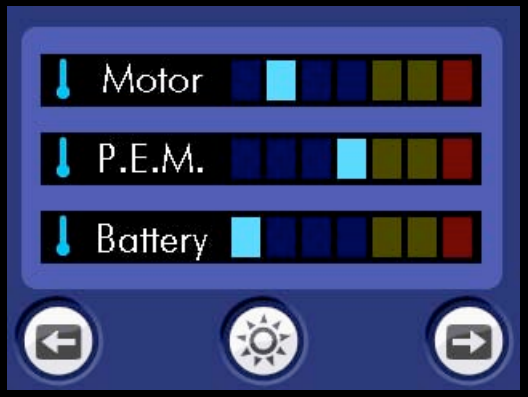


Energy

Trip

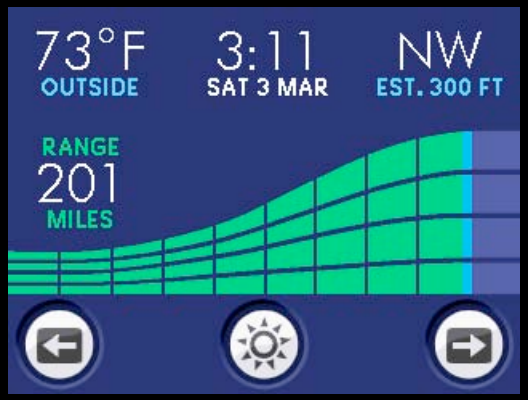
Performance

Clock

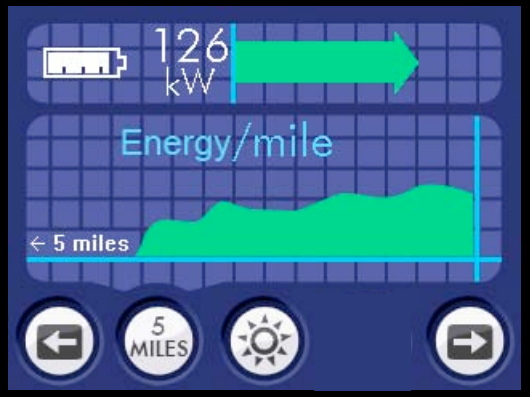


Vitals

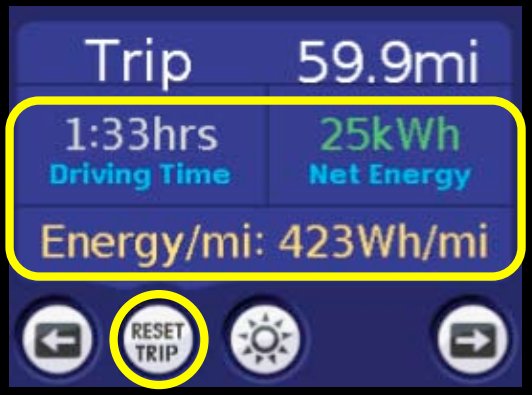
Driving Screens



Standard



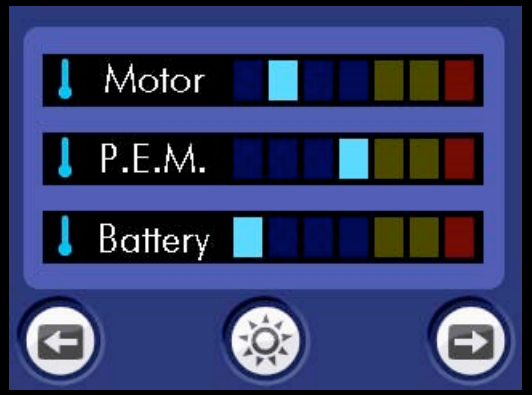
Energy



Trip

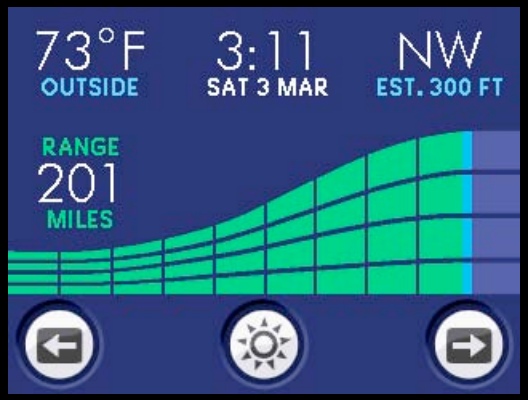
Performance

Clock

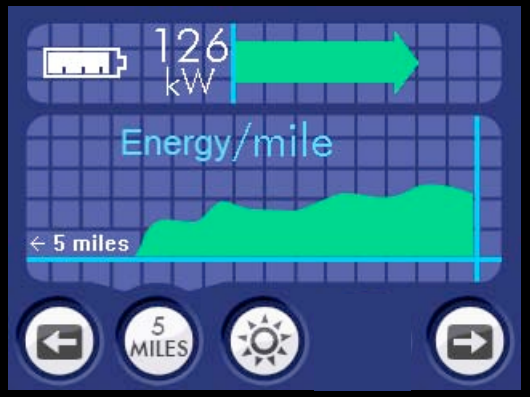


Vitals

Driving Screens



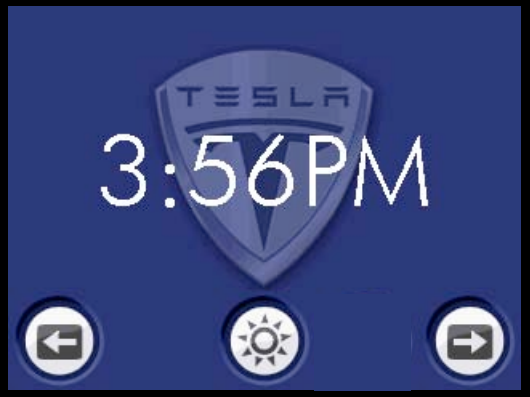
Standard



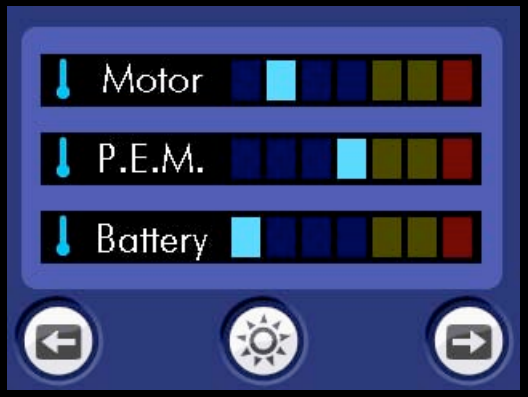
Energy

Trip

Performance

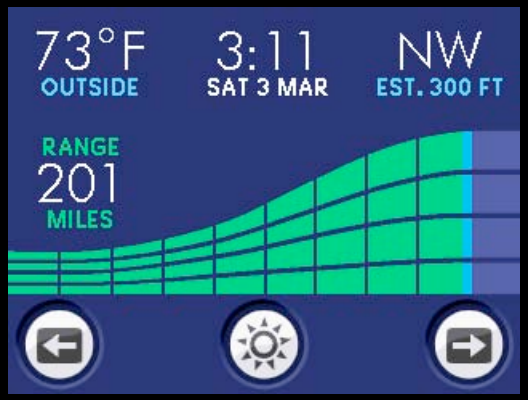


Clock

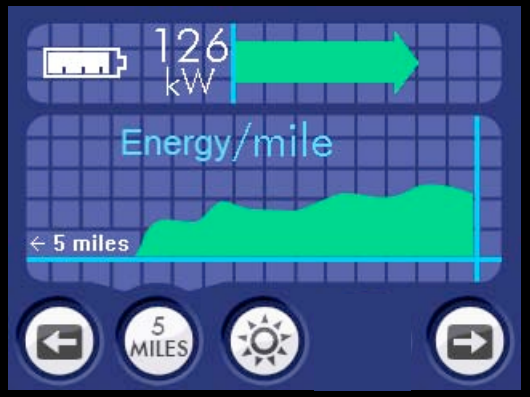


Vitals

Driving Screens



Standard

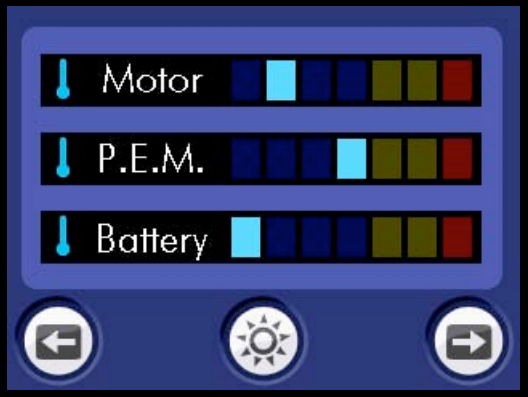


Energy

Trip

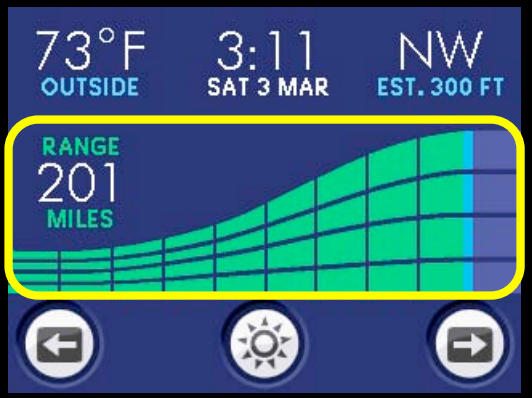
Performance

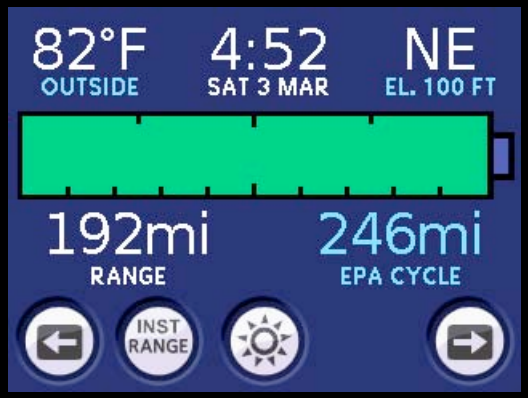
Clock



Vitals

Driving Screens

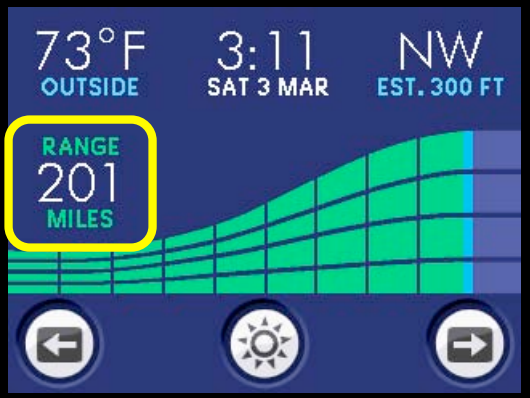




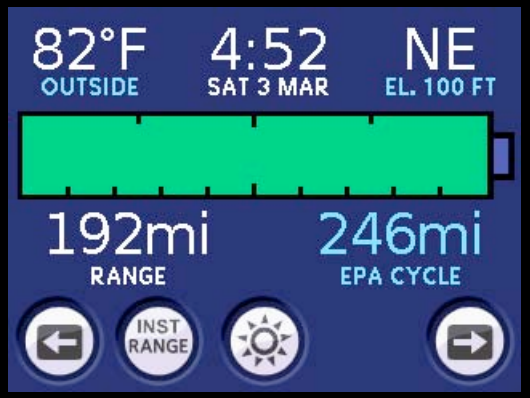
Version 1 Version 2

Graceful… But Misleading?

Driving Screens



Version 1



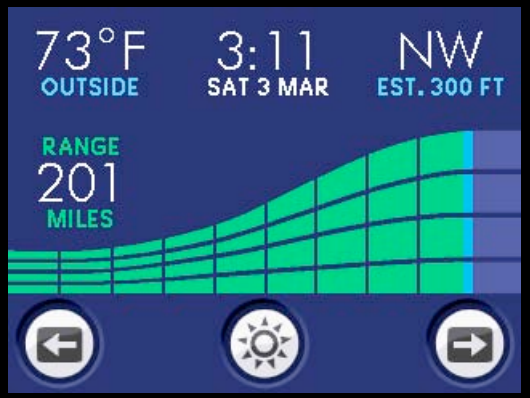
Version 2

Conflicting Range Expectations:

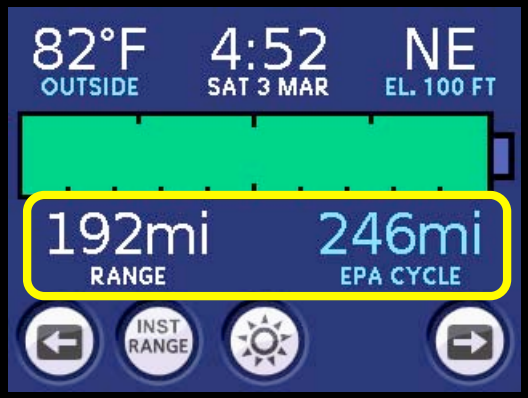
Marketing: EPA Drive Cycle

Engineering: 30mile History

Driving Screens

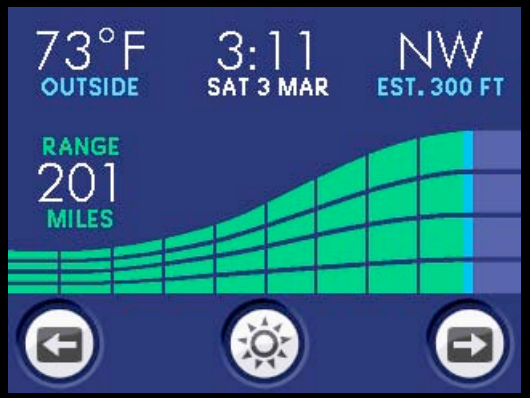


Version 1

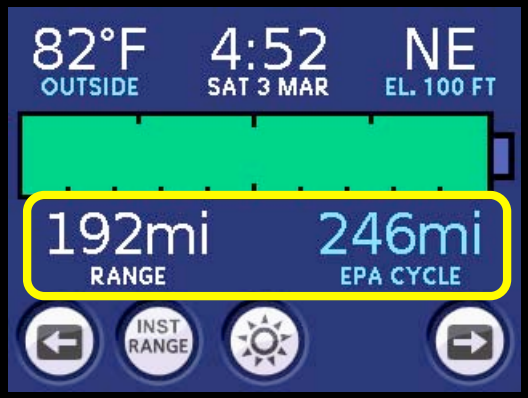


Version 2

Driving Screens



Version 1



Version 2

Google Maps-Based Trip Planner, anyone?

Key Achievements

Designed the main UI for the Tesla Roadster

Key Achievements

Designed the main UI for the Tesla Roadster

Designed dashboard LCD display (and font!)

Key Achievements

Designed the main UI for the Tesla Roadster

Designed dashboard LCD display (and font!)

Lobbied successfully for audio feedback

Key Achievements

Designed the main UI for the Tesla Roadster

Designed dashboard LCD display (and font!)

Lobbied successfully for audio feedback

Designed vehicle sound effects suite

Key Achievements

Designed the main UI for the Tesla Roadster

Designed dashboard LCD display (and font!)

Lobbied successfully for audio feedback

Designed vehicle sound effects suite

Specified vehicle behaviors

Key Achievements

Designed the main UI for the Tesla Roadster

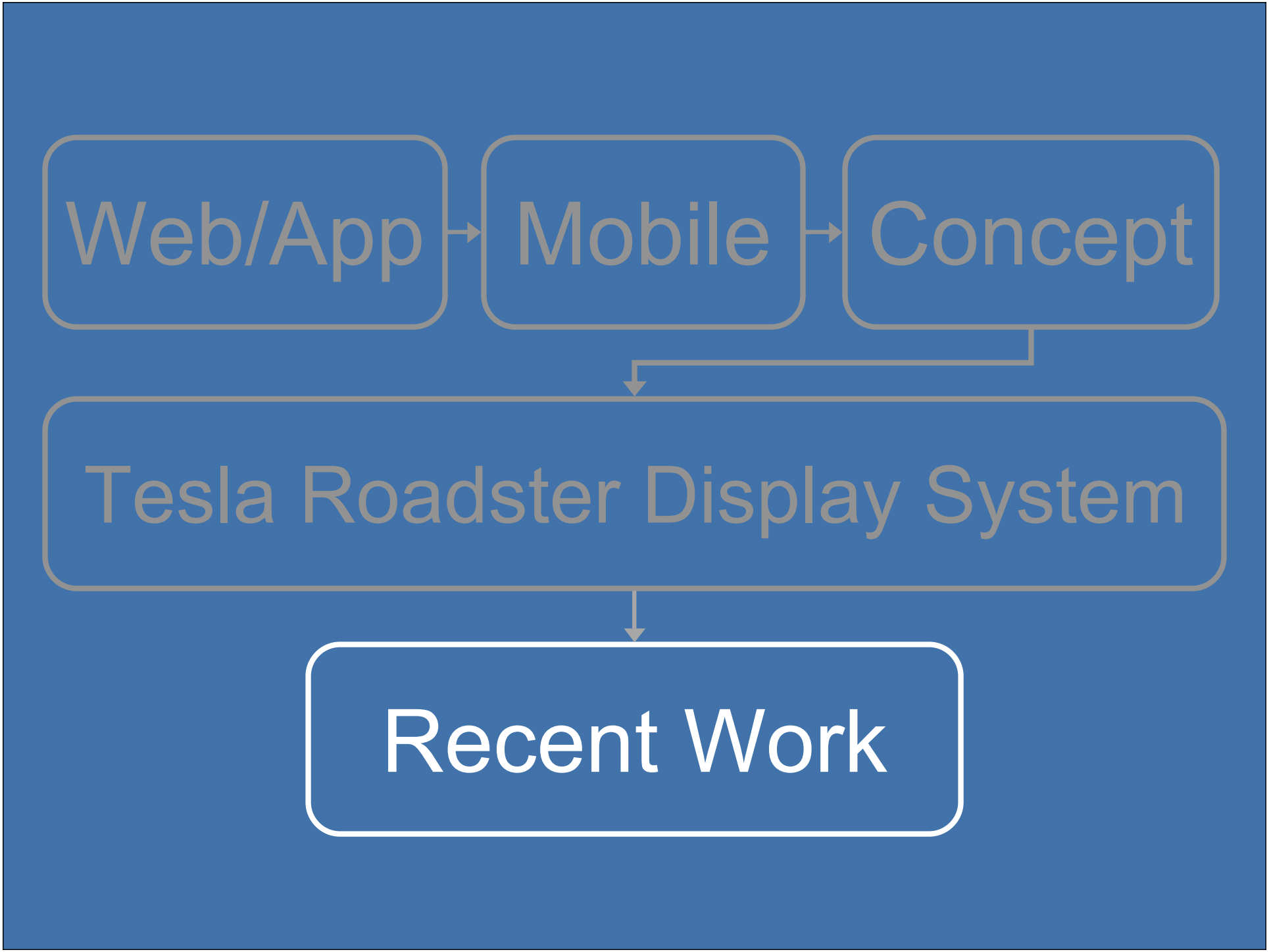
Designed dashboard LCD display (and font!)

Lobbied successfully for audio feedback

Designed vehicle sound effects suite

Specified vehicle behaviors

Authored concise (< 10 word) messages for ~1000 alerts

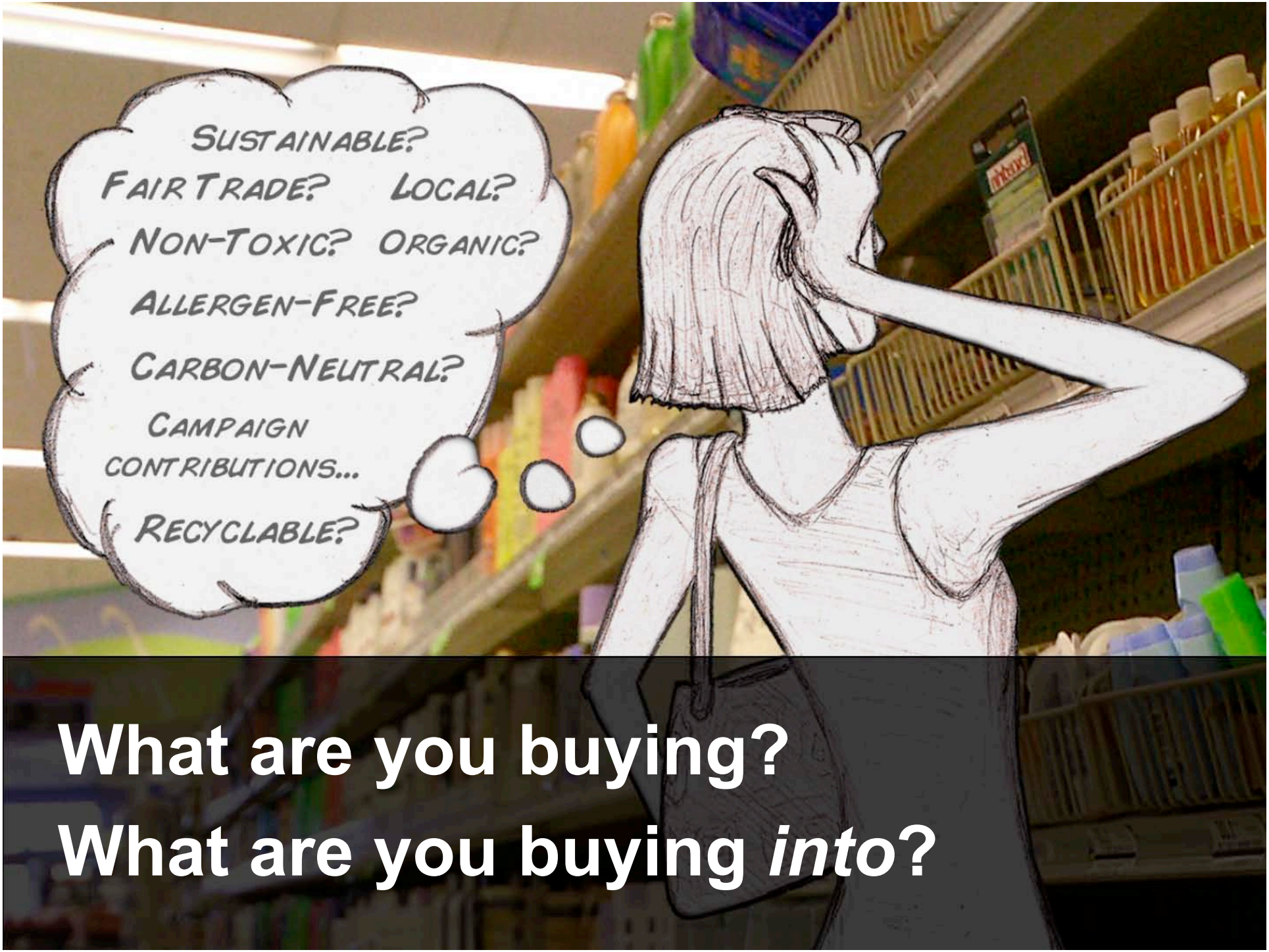

Web/App
Mobile
Concept
Tesla Roadster Display System
Recent Work

Tim Berners-Lee @ TED

From Documents to Data

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org


SUSTAINABLE?
FAIR TRADE?
LOCAL?
NON-TOXIC?
ORGANIC?
ALLERGEN-FREE?
CARBON-NEUTRAL?
CAMPAIGN CONTRIBUTIONS...
RECYCLABLE?



What are you buying?
What are you buying *into*?

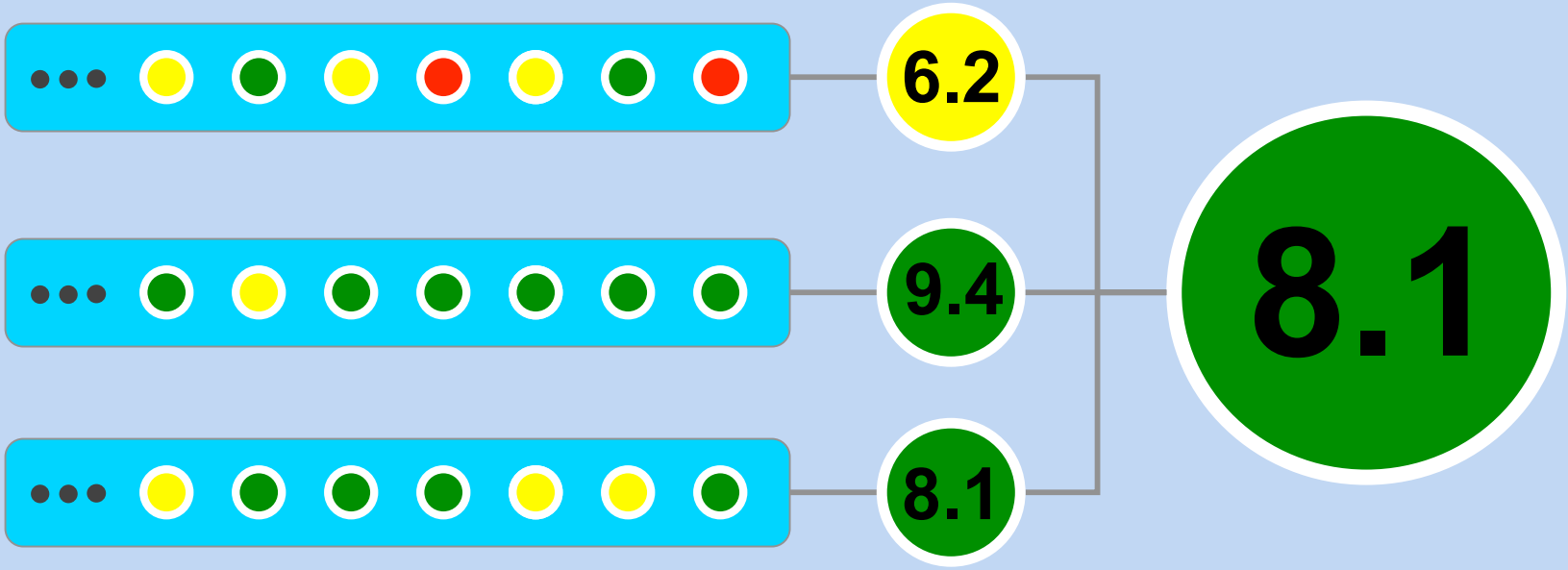
GoodGuide™

Rating Products & Companies on:

- **Health**
- **Environment**
- **Labor Practices**

GoodGuide™

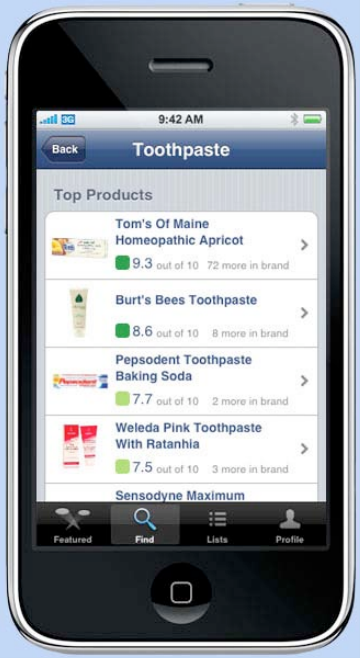
Rating Products & Companies



GoodGuide™

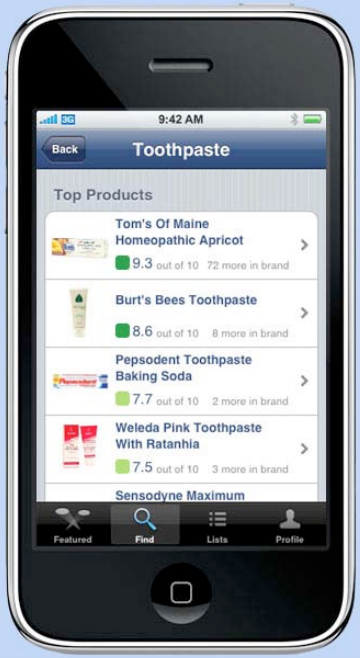
Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

GoodGuide™



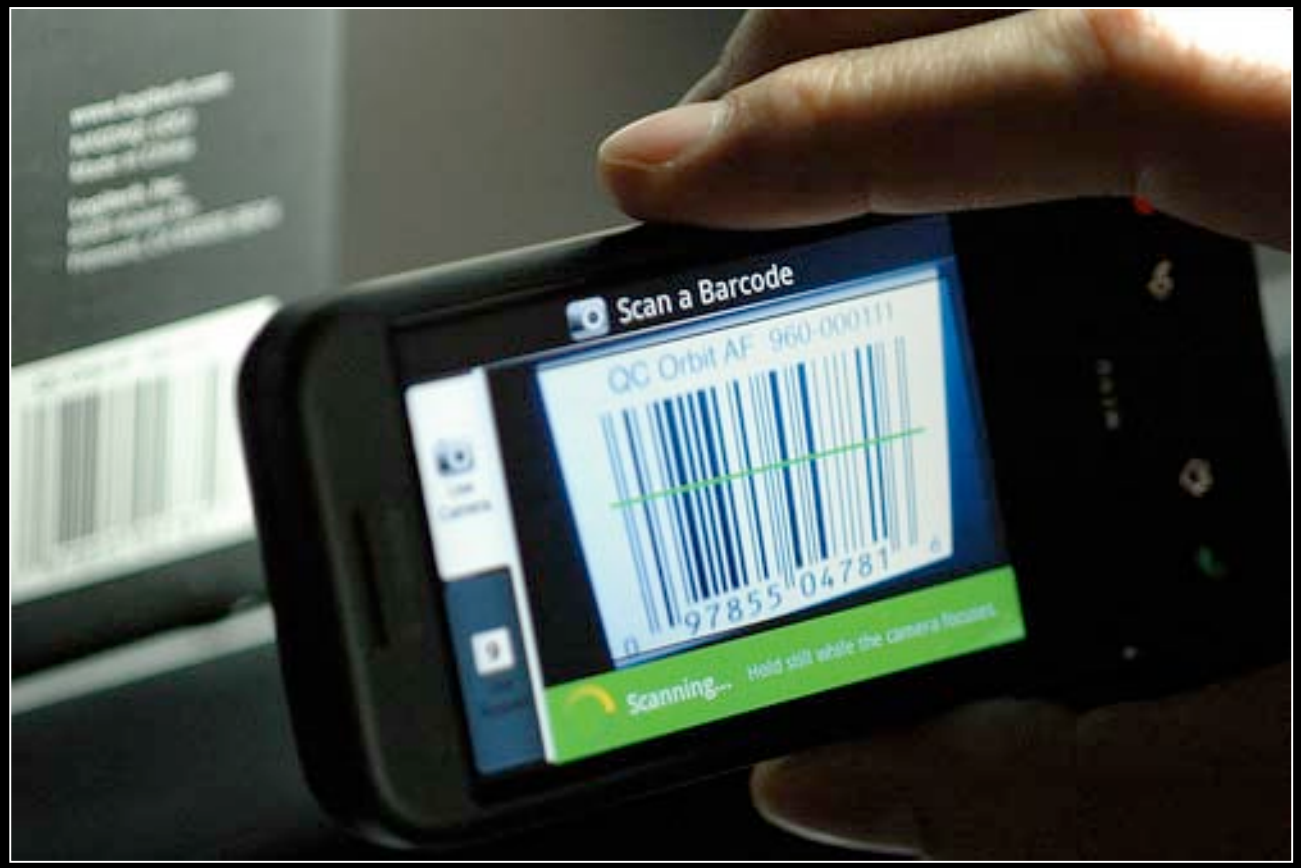
Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

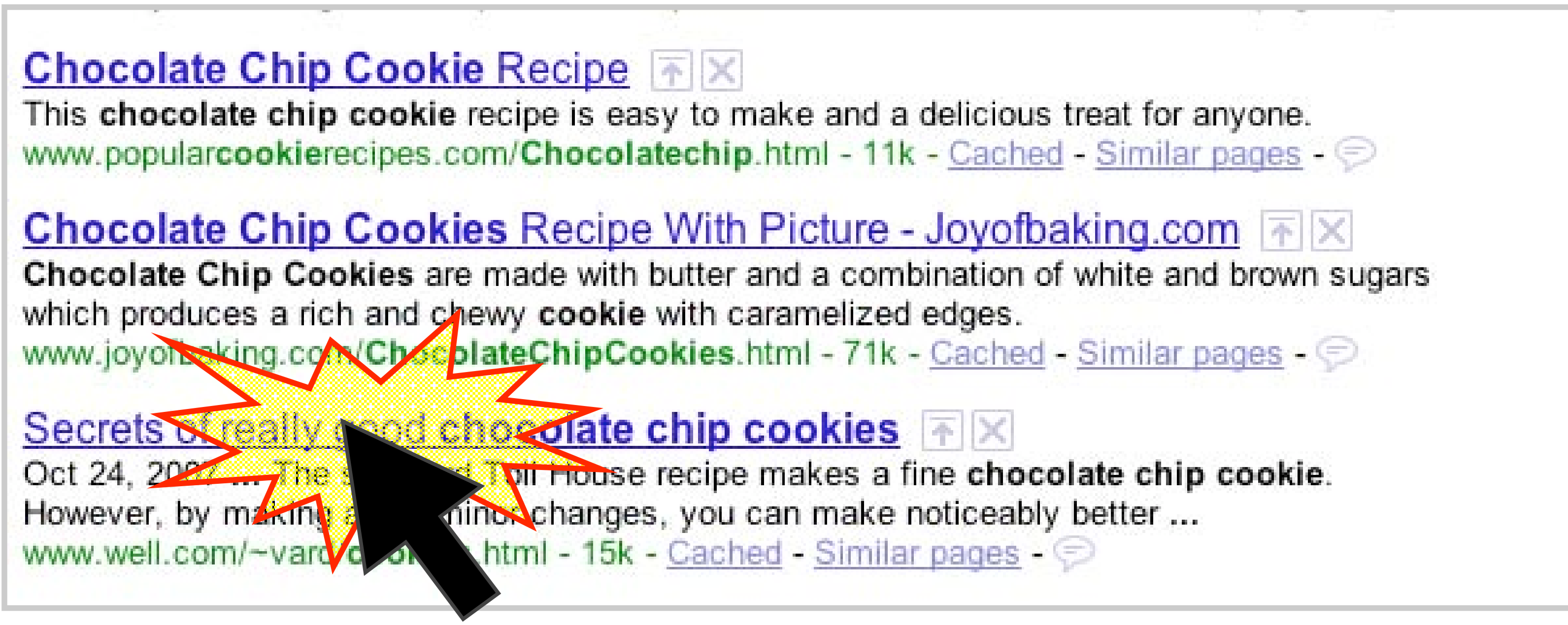
GoodGuide™

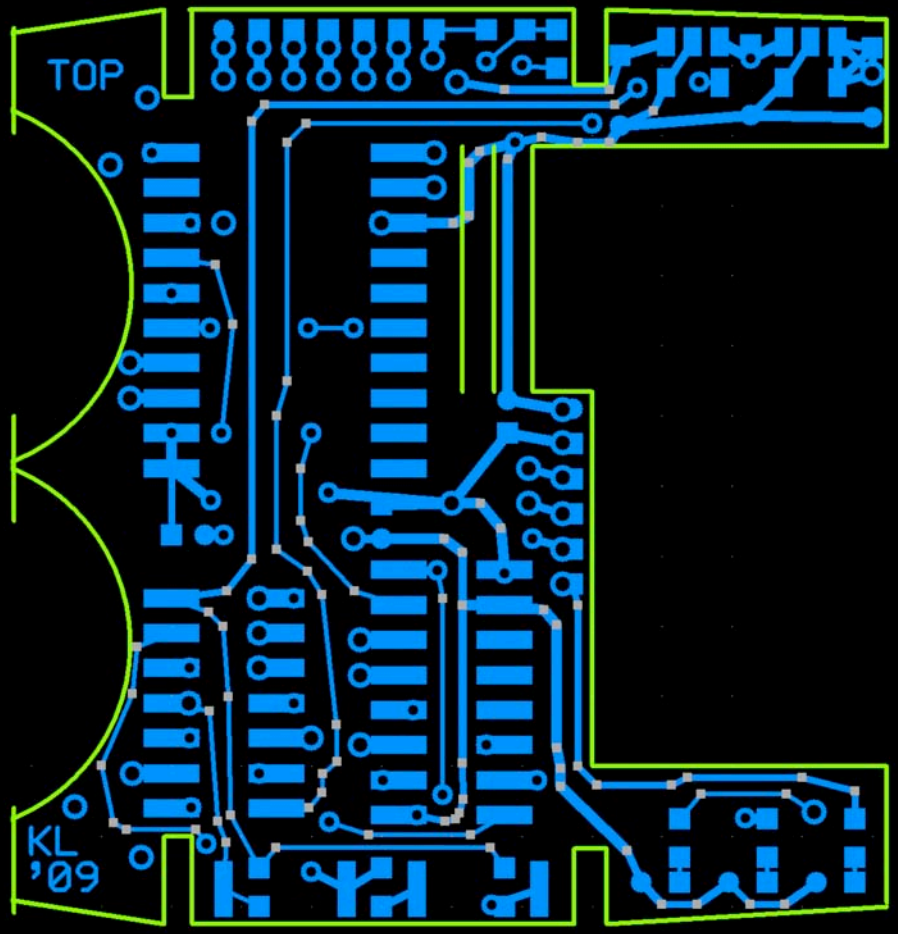


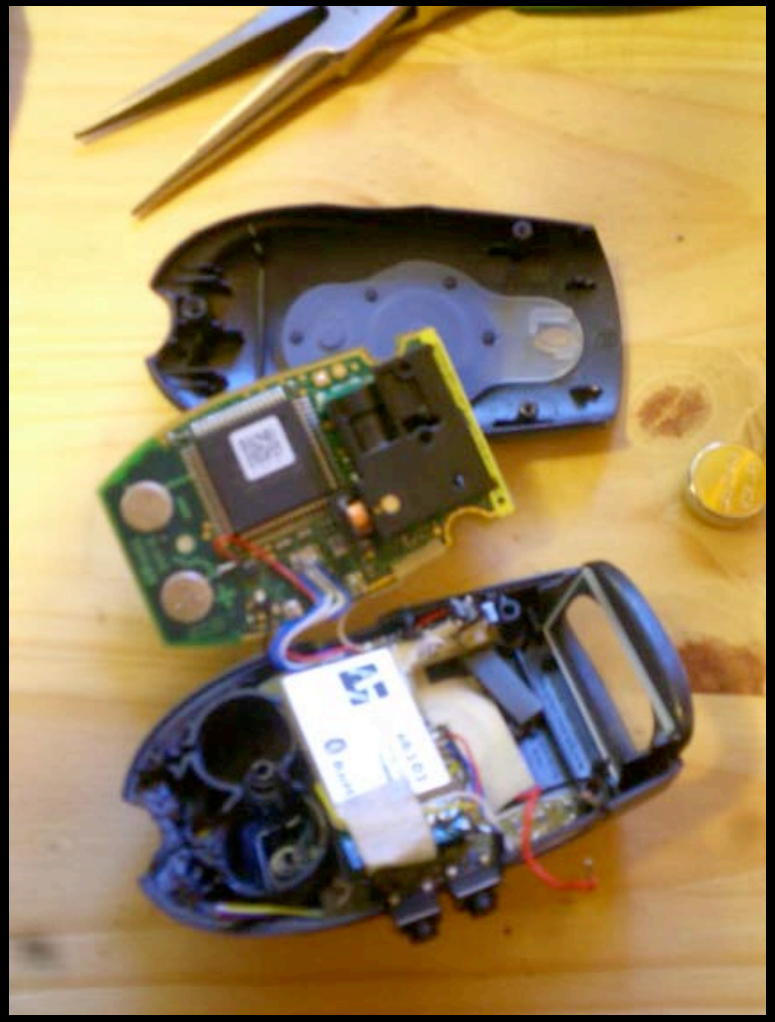
Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org


SUSTAINABLE?
FAIR TRADE?
LOCAL?
NON-TOXIC?
ORGANIC?
ALLERGEN-FREE?
CARBON-NEUTRAL?
CAMPAIGN CONTRIBUTIONS...
RECYCLABLE?
6 14141 00001 2

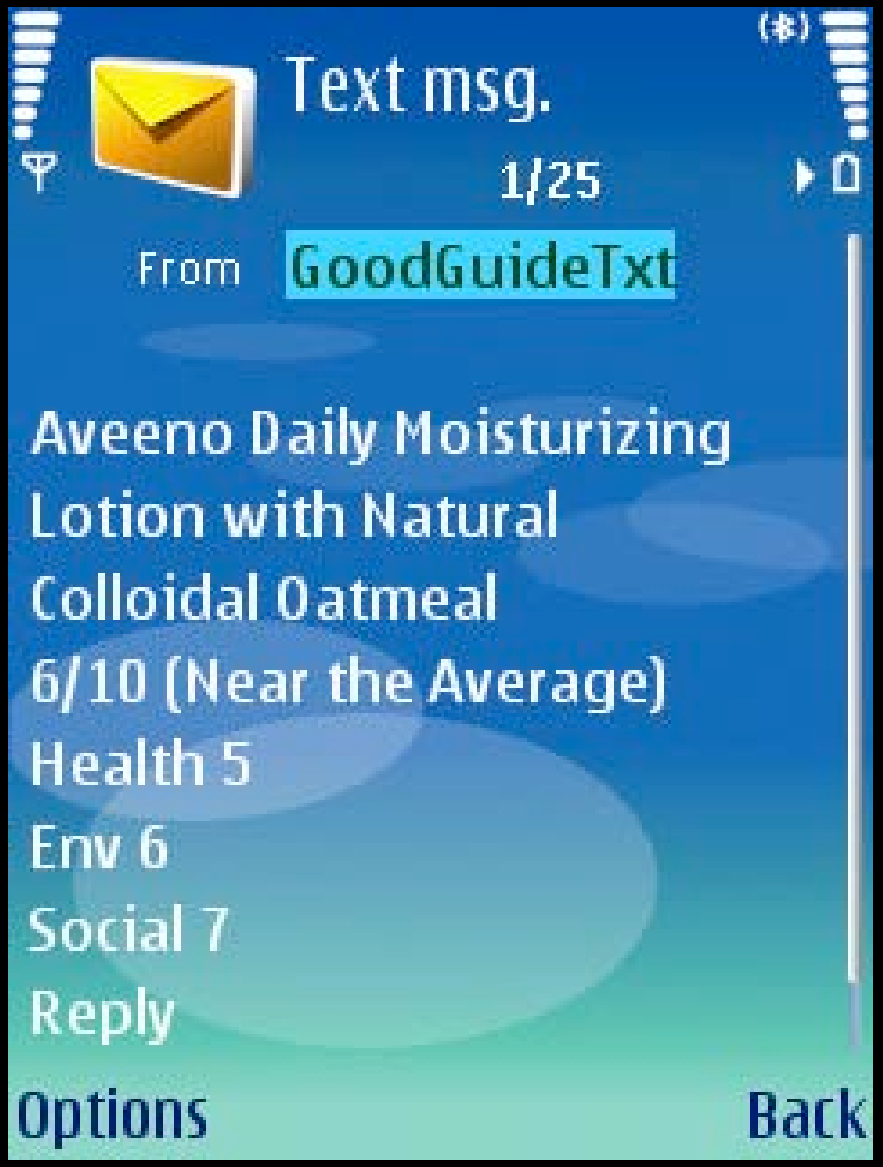

Scan a Barcode
QC Orbit AF 960-000111
97855 04781
Scanning...
Hold still while the camera focuses.


Chocolate Chip Cookie Recipe
This chocolate chip cookie recipe is easy to make and a delicious treat for anyone.
www.popularcookierecipes.com/Chocolatechip.html - 11k - Cached - Similar pages
Chocolate Chip Cookies Recipe With Picture - Joyofbaking.com
Chocolate Chip Cookies are made with butter and a combination of white and brown sugars which produces a rich and chewy cookie with caramelized edges.
lateChipCookies.html - 71k - Cached - Similar pages
Secrets
chip cookies
se recipe makes a fine chocolate chip cookie.
changes, you can make noticeably better ...
www.well.com/~vard
html - 15k - Cached - Similar pages

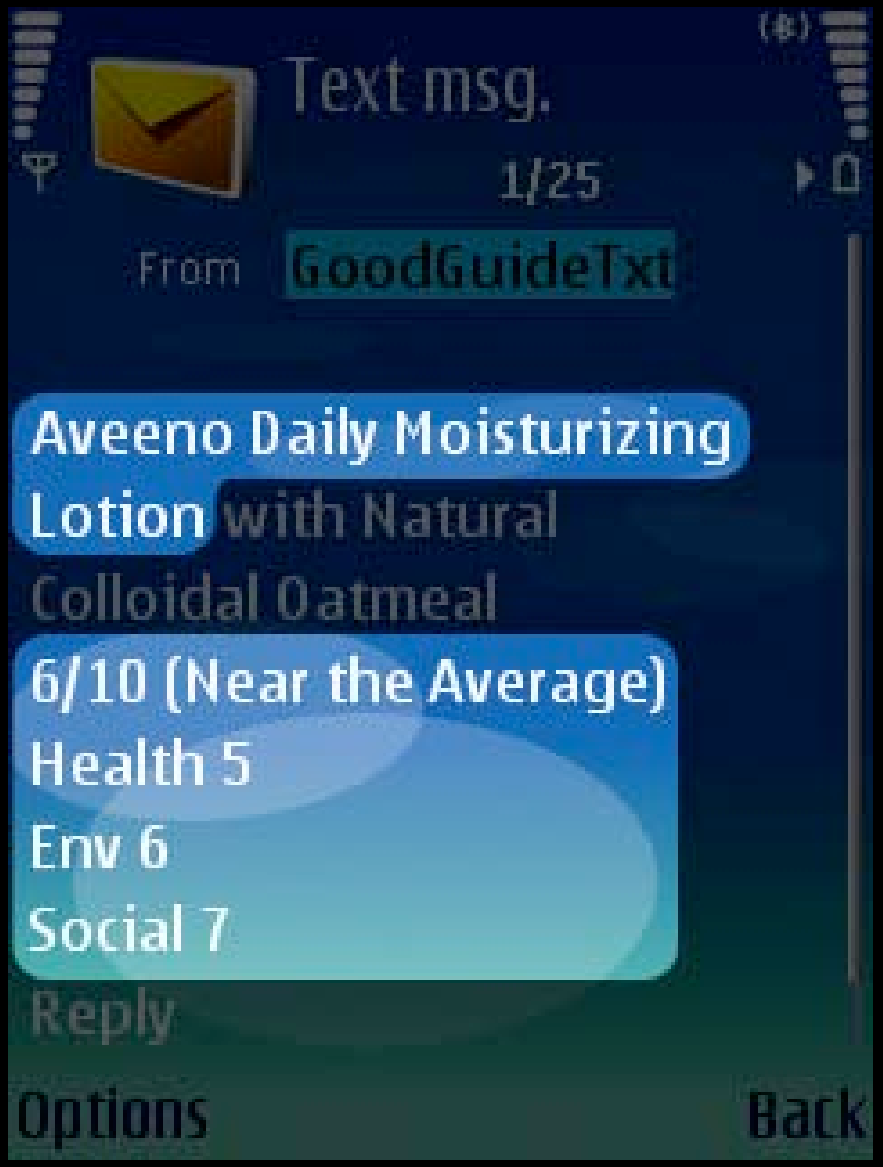

TOP
KL
'09




GoodGuide
SMS
Server


Text msg.
1/25
From GoodGuideTxt
Aveeno Daily Moisturizing
Lotion with Natural
Colloidal Oatmeal
6/10 (Near the Average)
Health 5
Env 6
Social 7
Reply
Options
Back


GoodGuide
SMS
Server


Text msg.
1/25
From GoodGuideTxt
Aveeno Daily Moisturizing
Lotion with Natural
Colloidal Oatmeal
6/10 (Near the Average)
Health 5
Env 6
Social 7
Reply
Options
Back


Golden Tanning
15
30
50
30
55
80
80
Neutrogena
sun fresh
build-a-tan
micro-mist
ISLAND
Gradual Tan


BUY BIG.
SAVE BIG.
CLUB ITEMS AT
CLUB PRICES!


WHOLE FOODS MARKET
D E L I G H T !
WE
Value
your Health
any 6 bottles of wine
10% off


Extra Gentle Cleanser
Fresh Foaming Cleanser
Fresh Foaming Cleanser
Neutrogena
HEALTHY DEFENSE
deep clean
Neutrogena
DEEP CLEAN
Neutrogena
DEEP CLEAN
6.49
11.99
8.75
7.99
6.29
6.29
NO CARD NEEDED
$1.50
Safeway
7.99
Clear Pore
Blackhead Eliminating
DAILY SCRUB
Neutrogena
Clear Pore
Oil-Eliminating Astringent
Neutrogena
Rapid Clear
Acne Eliminating Spot Gel
8 HOURS
Neutrogena
Rapid Clear
Oil-Eliminating Foaming Cleanser
Neutrogena
Acne Spot Control
Body Clear
Body Scrub
Neutrogena
Body Clear
Body Wash
Neutrogena
8.49
6.29
8.49
8.49
8.99
7.69
7.69


Extra
Gentle
Cleanser
Fresh
Foaming
Cleanser
HEALTHY
DEFENSE
DEEP
CLEAN
DEEP
CLEAN
8.49
6.29
7.69
7.69


WHOLE FOODS MARKET
D E L I G H T !
WE
Value
your Health
any 6 bottles of wine
10% off

Google • Spring, 2009 • Krispin Leydon • krispin@alum.dartmouth.org

Thanks for listening!

Questions?

Comments?

Krispin Leydon
krispin@alum.dartmouth.org
www.krispinleydon.net