Teaching digital skills

Learning usability testing by peer training

Shannon McHarg
UX Designer
Office of Natural Resources Revenue

Maroya Faied
Program Analyst
Office of Natural Resources Revenue
Who we are
What is the Office of Natural Resources Revenue?

For the benefit of all Americans, ONRR collects, accounts for, and verifies natural resource and energy revenues due to States, American Indians, and the U.S. Treasury.
Our team manages an open data website about how the U.S. government manages energy and mineral resources, revenue, and disbursements from federal lands and waters.

revenuedata.doi.gov
We are informing policy debates and raising public awareness by building the definitive source of timely and useful data about how the government manages federal energy and mineral resources, revenue, and disbursements.
Who we are

Who uses our site

Finding Data on the Site

**Known Question**
Someone else is asking them for information or they have a specific question or number they need.

**System Understanding**
They want to understand the process or system and how well it is working at a high level.

**Exploration**
They have a topic they want to learn more about or are looking for the data to tell them a story.

Usage of the Data

**Provide an Answer**
Provide just the answer to the known question to the asker of the question.

**Present Data**
Tell the story of the numbers. Could be in an article, report, or chart.

**Make a Decision**
Wants to read and understand the information to make a decision.
Driven by EITI requirements and their multi-stakeholder group, ONR brought in a Presidential Innovation Fellow to conduct research and create a prototype of the site.

The Presidential Innovation Fellow went on to become one of the founders of 18F, so ONRR pitched the project to continue the development of the site and they accepted it as one of their first projects.
Who we are

Team structure

Product Manager/Product Owner
Jennifer Malcolm

Term limited (24 years) innovation specialists

Developer
Jeff Keene

Content Strategist
Ryan Johnson

UX Designer
Shannon McHarg

Career government employees

Program Analysts
Chris Mentasti
Maroya Faied
Lindsay Goldstein
Who we are | How we got here

**December 2012**
The Secretary of the Interior formed a multi-stakeholder group (M50), which included representatives from government, industry, and civil society.

**May 2013**
The OMB issued an Open Data Policy (M 13-13) requiring government agencies to make datasets open and available to the public and to engage with customers when doing so.

**December 2013**
The U.S. submitted an application to participate to the EITI International Board, which was developed by the M50 after engaging with stakeholders across the country.

**March 2014**
The EITI International Board accepted the U.S. as a candidate country.

**Summer 2014**
DOI selected Deloitte & Touche LLP as the Independent Administrator for USEITI.

**November 2016**
USEITI Annual Report was published as an Executive Summary and interactive data.

**January 2018**
The proprietary stats site was decommissioned giving ONRR the ability to expand the data publication process and increasing our internal audience.

**March 2018**
The President's Management Agenda set Cross-Agency Priority (CAP) goals around improving customer experience and using data as an asset.

**Fall 2018**
We were fully transitioned from 18F support with a full innovation design team and 3 program analysts.

**December 2018**
21st Century IDEA (Integrated Digital Experience Act) was passed furthering our user-centered mission.

**December 2015**
USEITI Annual Report was published as an Executive Summary and interactive data website with the help of a Presidential Innovation Fellow (and eventually 18F).

**2019**
January 2019
The OPEN (Open, Public, Electronic and Necessary) Government Data Act was passed furthering our mission to provide open data.

**Today forward**
Our team continues to work in the open to make our data publicly available and design with users and training our team members in digital skills.
Who we are | Our process

**Validate Built Product**
- Usability testing
- Iterate design/build as needed or feed into future problem identification

**Build Solution**
- Flesh out design details and build using agile
- Iterate as necessary

**Select Final Solution**

**Balance:**
- User needs
- Technical constraints
- Timeline
- Other constraints

**Generate and Test Solutions**
- Brainstorm possible solutions
- Communicate ideas to users to get feedback
- Synthesize and analyze feedback
- Review what we learned with the team
- Iterate as needed (to make sure we’re on the right path to building the right thing)

**Identify Problems**

Sources of problems:
- Previous user research
- Calls/emails to Data Retrieval or Data Display
- FOIA requests
- Analytics

**Formulate & Validate Hypotheses**
- Understand the current state process and problems
- Put ourselves in the shoes of the user
- Talk about team’s hunches
- Incorporate problems and hunches into hypotheses to test
- Exploratory research with users to identify real user needs
Peer training
Why we decided to peer train

- The scope of our site keeps increasing
- Other teams in our agency are interested in user research
- We have a small team with only one, term limited designer
- Recruiting participants takes a LOT of time
We decided that it would be best to learn by doing and do mock interviews.
Which meant...
I had to document all of my processes in detail.
While I did that...
Maroya and Lindsay started by reading about user research to get the basics and hear it from the experts.
Peer training | Usability testing process

### Planning
- Decide on study goals
- Write study plan & interview guide
- Recruit participants
- Plan for note taking

### Conducting the study
- Facilitate the sessions
- Debrief with observers after each session

### Analysis
- Consolidate findings across participants
- Identify trends and recommendations
- Present to the team and post on GitHub
- Create issues for anything we decide to fix
- Carry any remaining issues to ongoing findings documentation
Planning

- The analysts put together a study plan and guide to test a prototype for a new design.
- The two analysts practiced facilitating on each other.
- Then we recruited our teammates to participate as fake participants, mimicking things we’ve seen real users do in previous studies.
Peer training | Study plan

Background

We have created a production filterable table to be able to sort our annual and monthly production using various relevant filters. The annual table will list all the commodities, and the monthly table will only list the highest producing commodities. These will serve as a home for lease level data once it is available. We want to evaluate these designs with users.

Link to Filterable Production Table Draft: https://4cahw1.axshare.com/#g=1&p=explore_data

Goals

- Determine how the users would use this table as a part of their overall task
- Determine the best approach for filterable production tables on the page.
- Determine the best approach to display trends (bars or sparkline)
- Determine the best categories to be listed under “organized by” and “sort by” columns
- Determine the best language to use for “land owner” column (Federal, Native American, Mixed), source, commodity column, and any other language on the pages.
- Determine how table should be sorted.
- Determine if volume is needed by users.
- Determine best hook for lease level data.

Method and Desired Participants

Over the course of a few weeks, we would like to interview at least 5 participants from the following user groups for 30 minutes 1:1 interviews. We will focus on users that have oil and gas experience and understand production data and different commodity units.

- Question Answerers: These are people like congressional aides and internal liaisons who use the site to answer specific questions.
- Agenda Supporters: These are people like those from NGOs or industry who use the site to see how the data supports an agenda they already have in mind.
- Storytellers: These are people like journalists and academics who want the data to tell them a story that they want to share with other people.
- Domain Learners: These are people like state and county government reps and tribal leaders who want to monitor what’s going on within their domain and understand the whole system.

Recruitment Strategy

In order to recruit research participants from our target user groups, we will contact people who are familiar with the site or oil and gas production data. We will recruit internally from ONRR and externally.

We are hoping to speak with ONRR employees who are familiar with our data and can help evaluate if the data organization makes sense. We would also like to speak with company representatives who are responsible for production reporting. We are reaching out to ONRR production team to get referrals. We will also use social media and outreach events to recruit participants.

Test Assets

We will be testing the link on the Explore Data page that takes the user to the filterable tables and lease level data to understand if users understand the link’s purpose and if placement is intuitive.

We will be testing the following:

- Explore Data page with links to filterable table
- Yearly production, monthly production
- Search leases and agreements
- Monthly filterable table
- Term Source
- Sort by & Organize by
- Trend helpful?
- Yearly filterable table
- Commodity level (oil)
- State level (California)
- State and Commodity (California oil)
- Yearly bars

-
Peer training | Interview guide

Intro

Introduction
Thank you for taking the time to participate in our research study. I will be conducting the interview, and my teammates will be listening in to take notes and observe. Our goal in this team is to talk to users about our site, test how they would complete a task, and observe how they are using it to learn about possible improvements to the site.

External users
I have a form for you to digitally sign giving us permission to conduct the study. It just states your rights as a participant and that we won’t be capturing any personally identifiable information.

• Consent form: Google form

User Task Background (people don’t fit our user profiles) (5 min)
Tell us a little bit about your background, so we can get a sense for where your perspective is coming from.

User Task Background (people who fit our user profiles) (20 min)
• What is your role and how do you use natural resources data in that role?
• Have you used the Natural Resources Revenue site before?
• Can you walk us through how you would find the data, analysis you would perform on the data, and how you would use or present the data?
• Is production data by lease and agreement important to you?
• Which specific pieces of information do you need?
• How do you currently access the production data you need to do your job?
• How can the portal help facilitate that process?
• Is there a geographic component to how you want to use that data?
• In what format would you like to see monthly production data?
• How would you like to search for the data (e.g., by lease or agreement number in a database, on a map)?
• What kind of questions do you get from other people about production, particularly at the lease level?

Interview testing process:
• We’re testing the design we’re not testing you.
• There are no right or wrong answers.
• Please think out loud as we’re conducting the interview for us to understand your thought process as you are exploring the site. We want to know what you would do if we weren’t watching.
• We are testing the design and different prototypes and not everything may be clickable.
• We appreciate your honest feedback to help us improve our design.

Tasks & Questions:
• Can you tell me a specific task you use the data for? Can you walk us through how you would find that information?
• Take a look at this page and tell me what this site is about.
• What do you think of the information that’s presented?
• Is this information useful?
• Is there any information that you would like to see added to the table?
• Take a look at this page and tell me what you would like to see added to the site.
• Complete the task identified in the previous task, if possible.
• If you wanted to know how much oil was produced in 2014, how would you get there?
• Is that where you thought it would be? Did the placement make sense?
• How many years back do you want to see data? What do you use historical data for?
• Is it helpful to see the ten year trend?
• Do you need all the numbers in the table?
• How many years show the table in by default?
• What does the “last owner” column tell you?
• How would you elaborate “federal” “Native American” and “mixed”?
• What does “mixed” mean to you for lease ownership?
• What do you think the “organize by” dropdown does? Have there been times when it was what they expected?
• Would there be another category you would like to see here?
• Are there any that don’t make sense to you?
• What do you expect the “sort by” dropdown to do? Have there been times when it was what they expected?
• Would there be another category you would like to see here?
• Are there any that don’t make sense to you?
• What is the difference between “organize by” and “sort by”?
• What does “withheld” mean to you? Would you like to see the states listed for commodities withheld data?
• Let’s say you’re interested in looking at monthly production for the this year so far. How would you do that?
• Is it helpful to provide monthly data in a table format for the top producing commodities?
• Do you like the way the table is organized?
• What do you think “source” refers to? Do you have a better term?
• What do you think about the use of the word “commodity”? What does the word commodity mean to you? What does the word “product” mean to you? What do you expect to find in this column?
• What would you expect to happen when you click the download icon?
• Is it helpful to have the trend chart?

Close (2 min)
• Are you interested in participating in future studies? Do you have any other specific areas of the site (or data elements) that you’re interested in providing feedback on?
• Is there anything else you would like us to keep in mind when we’re thinking about displaying, sharing or harvesting data?
• Thank you for your time. Your insights have been helpful to us in understanding how we might improve processes around and sharing, disseminating data. If there is additional information that comes to mind that you think might be helpful please feel free to reach out to me via email.

Prototype Menu: https://www.dropbox.com/sh/ft6b3tupuwmagnl/AACCVQcYQ94wuelg3bGxWqB8a/aware Xm?dl=0
Peer training | Planning learnings

• Goals of the study
• Method & desired participants
• Recruiting strategy
Conducting the study

The analysts took on all of the logistical tasks of the study moderator.

- Conducting the study
- Communicating with the participants
- Troubleshooting technology issues with Google Hangouts
- Ensuring we had a note-taker
- Coordinating the post-session debriefs

After each session, the designer provided feedback on the moderator’s facilitation.
Peer training | Conducting the study learnings

- Being Organized
- Interacting with participants
- Observing actively
The analysts took on all of the analysis

- Consolidating findings
- Identifying trends and recommendations
- Creating a findings summary and presenting to the team and posting to Github
- Creating issues for agreed on changes
- Documenting items for future analysis

The designer provided feedback on the analysis.
Peer training |

Findings consolidation spreadsheet

<table>
<thead>
<tr>
<th>Participants</th>
<th>Grouping</th>
<th>Category</th>
<th>Finding</th>
<th>Recommendation</th>
<th>Priority</th>
</tr>
</thead>
</table>
| P1, P2, P3, P4, P5, P6, P7, P8 | Data Highlights | Data Highlights | Users got the interactivity on the data highlights.  
P1: Got the interactivity on Data Highlights, but was on an iPad and couldn’t hover.  
P2: Got how the interactivity works on the Data Highlights.  
P3: Got the interactivity on the graphs.  
P4: Got the interactivity on the charts, but didn’t expect them to change on hover or if they do, it should change the selection and stay changed.  
P5: Got how the interactivity worked for data highlights, but expected a tooltip treatment on rollover.  
P6: Liked interactivity on key facts and got how it worked.  
P7: Got how the interactivity on the graphs works.  
P8: Got how the interactivity works. | Add interactivity to Data Highlights. | 1 |
| P2, P4, P6 | Data Highlights | Home Content | The Data Highlights are overwhelming and confusing to new users.  
P2: Data highlights was overwhelming for him to see up front.  
P4: Liked the sentence under Data Highlights - thought it belonged more here than in the overview.  I think she thought Data Highlights was a label for the sentence, not the highlights.  
P6: In general, I like data visualization but I’m not exactly sure what I’m looking at here though. Wants to see revenue before production because he thinks the site is all about the money.  It wasn’t clear Data Highlights was for whole country until he saw the map. | Put that section below the map, which is friendlier to new users and consider better framing the purpose of the Data Highlights section | 1 |
## Findings presentation

### Table Organization: Sorted by Major Commodity

#### Production data

<table>
<thead>
<tr>
<th>Commodity</th>
<th>State/offshore region</th>
<th>Source</th>
<th>Land owner</th>
<th>Trend 10 years</th>
<th>Units</th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>29 states/regions</td>
<td>2 sources</td>
<td>Federal, Native, Mixed</td>
<td></td>
<td>bbl</td>
<td>811,781,280</td>
<td>816,662,345</td>
</tr>
<tr>
<td>Gas</td>
<td>31 states/regions</td>
<td>2 sources</td>
<td>Federal, Native, Mixed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td>12 states</td>
<td>Onshore</td>
<td>Federal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geothermal, direct use</td>
<td>New Mexico</td>
<td>Onshore</td>
<td>Federal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geothermal, direct use</td>
<td>Nevada</td>
<td>Onshore</td>
<td>Federal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table Organization

<table>
<thead>
<tr>
<th>Finding</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Majority of users understood drop down menu “organized by”</td>
<td>Define “Operators” and explore possibility of also adding a list of payors on the lease</td>
</tr>
<tr>
<td>Drop down menu “sort by” was confusing and different options need to be explored.</td>
<td>Explore other designs for the table where the first column is frozen, filter options like how excel functions, sum of total for all land owner types.</td>
</tr>
<tr>
<td>Users spent time performing specific tasks and were able to make several suggestions for improvements.</td>
<td>Explore options of showing more years or months by default on the table.</td>
</tr>
</tbody>
</table>
Peer training | Findings GitHub summary

Who We Interviewed

2 question answerers, 1 agenda supporter, 1 agenda support/storyteller, 1 storyteller, 1 domain learner

What We Tested

Prototype: https://icwhl.avehse.com/

Summary of Findings

Explore Data

- Most users able to navigate to the yearly production data from Explore Data page.

Yearly Table

- Users understood table but need to further explain meaning of withheld data.
- Users liked to drill down to data using table links as well as drill down menus.

Monthly Table

- Users like to use monthly for most updated data, but expected to see all commodities.
- Also liked to be able to drill down to state/county levels.

Table Organization

- Majority of users understood drop down menu "organized by".
- Drop down menu "sort by" was confusing and different options need to be explored.
- Users had several suggestions for improvement that will be explored.

Terminology

- "Commodity" was understood.
- Under the "Landowner" column, "Mixed" needs to be defined.

Offshore Planning Area

- Users didn't understand or care about this information.
- Consider removing this information.

Lease Level Data

- Found need to define terms "leases" and "agreements".
- Lease level data important to users.
- Explore and option to search geographically in addition to by lease or API well number.
- Trendlines
- Most users preferred "Option A" but users that download data didn't find it helpful.

Summary of Recommendations

- Define "withheld" and explore how to display that data.
- Explore different options to select for the sort by column.
- Define leases verses agreements.
- Explore a search option by map or geographically for leases.
- Consider removing this category since majority of participants did not care for offshore planning area for lease level data.
- Define "Operators" and explore possibility of also adding a list of payors on the lease.
- Majority of participants like trendline option A. Explore option of displaying a trendline only for the years selected on the chart.
- Define "Mixed" in landowner column.
- Explore options of showing more years or months by default on the table.
- Explore other designs for the table where the first column is frozen, filter options like how excel functions. Sum of total for all land owner types.
Peer training | Analysis learnings

- Summarizing findings
- Organize findings by scope & severity
- Recommending Design solution
Outcomes
“Learning usability testing was both fascinating and eye-opening. The experience of conducting an interview and analyzing the results stimulated my interest to approach future projects by observing problems and finding solutions by considering different perspectives.”

Maroya Faied, Program Analyst
Outcomes

Greater team engagement

- User empathy
- More detailed look at prototype
- Cognitive walkthrough
Outcomes | More process documentation
Planning time helps the work run smoothly.
Documentation makes it easier to spot opportunities for process improvement and sharing results.
Provides a method to incorporate many viewpoints without creating conflict amongst team members or work groups.
Increasing our capacity for user research is helping us build bridges with other teams in our agency who are working on products that could benefit from user feedback. We are helping introduce user-centered design practices to those teams.
Thank you! Questions?

Connect with us

- nrrd@onrr.gov
- https://revenuedata.doi.gov/blog/
- https://github.com/ONRR/
- @DOIONRR
- https://www.facebook.com/DOIONRR/
Photo attribution

"Creative Commons Bàrbara's 30th birthday - playtime! 11/11/11" by Jordi Payà, used under CC BY / Turned black and white from original

"Creative Commons Learning by doing 2009!" by Photo RNW.org, used under CC BY-ND

"Creative Commons Rowing Team at HMSP" by Virginia State Parks, used under CC BY