

Bringing UX in-house

Cultivating digital skills through peer training



U.S. Department of the Interior: Office of Natural Resources Revenue



Maroya Faied
Program Analyst



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Program Analyst



Shannon McHarg
UX Designer



Who we are

The Office of Natural Resources Revenue collects, accounts for, and verifies natural resource and energy revenues due to states, Native Americans, and the U.S. Treasury.



Our team manages an open-source, open-data website to serve that mission and support public engagement in the process.

revenuedata.doi.gov



Our product vision

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.

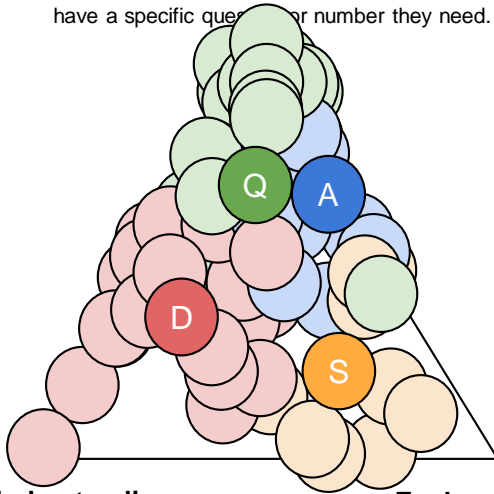


Who uses our site

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.

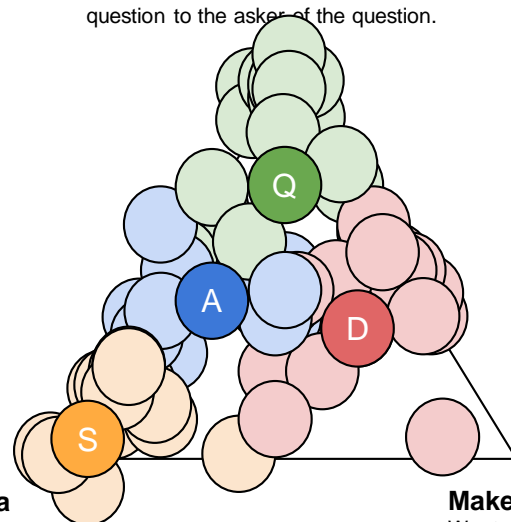
Exploration

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.



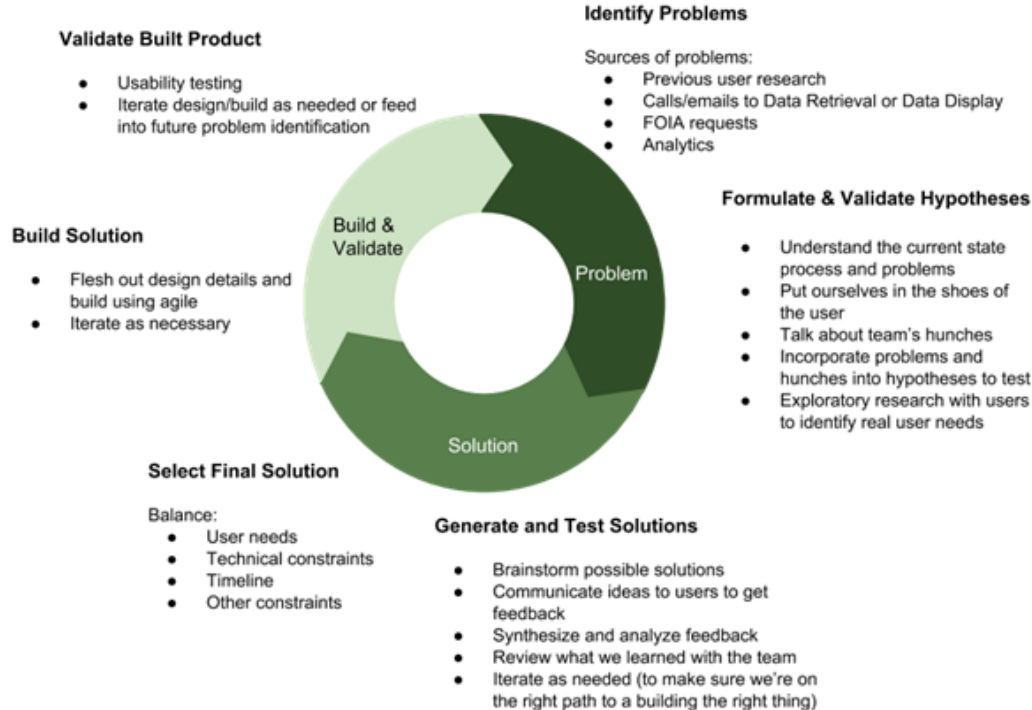
Present Data

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

Make a Decision

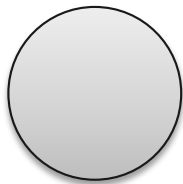
Wants to read and understand the information to make a decision.

Our user-centered design process



Our team

Career government employees



Team Manager

Vacant



**Product
Owner**

Jennifer Malcolm



Program Analysts

Maroya
Faied



Lindsay
Goldstein

Term limited (2-4 years) innovation specialists



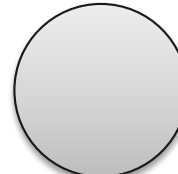
Developer

Jeff Keene



UX Designer

Shannon McHarg



Content Strategist

Vacant (may be
replaced with career
employee)

Contractors



Developer

Mojo Nichols



Developer

Jerome Louis

Rewind to 2014...



The United States government had joined the Extractive Industries Transparency Initiative (EITI).

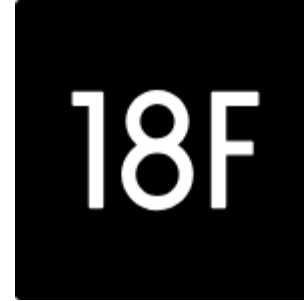


The EITI is a global standard for the good governance of oil, gas, and mineral resources.





Driven by EITI requirements, our office brought in a Presidential Innovation Fellow to conduct research and create a prototype of the site.



18F, a digital consultancy within the federal government, is formed and our office pitches the project to continue the development of the site.



18F can't work on every agency's project indefinitely.

By 2017, it was time to transition the work to the
Office of Natural Resources Revenue.



Even though the U.S. pulled out of the EITI, our agency decided to hire an in-house team with digital skills to continue working the way 18F worked to keep the spirit of EITI alive.

The team needed to be cross-functional, user-centered, and strategic.



To get around federal government hiring roadblocks, this team was hired into term-limited positions. Limited to 2-4 years.



So, we are training our career government employee teammates to carry on our work after the innovation specialists term out.





User research peer training

User research seemed like a natural fit for our first foray into training the program analysts because it's well suited for people who are already trained in analysis.



The program analysts had already been participating in studies by taking notes and participating in debriefs and they both had an interest in picking up the skill.



We also knew that other teams within our agency were interested in user research, so we figured that if we grew capacity to do user research, we could spread digital literacy further in the organization.



We decided that it would be best for the program analysts to learn by doing and conduct mock interviews.



Which meant...



A grayscale photograph of a person with glasses and a ponytail, wearing a dark shirt, sitting at a desk. They are looking down at a laptop screen. The desk is cluttered with various items: a laptop on the left, a water bottle, a pen holder with several pens, a calculator, a small box, and numerous papers and sticky notes scattered around. The person's right arm is resting on the desk, and they are wearing a watch. The overall scene suggests a busy, creative workspace.

**The designer had to document
all the user research processes
in detail.**

While she did that...





A Practical Guide to Usability Testing

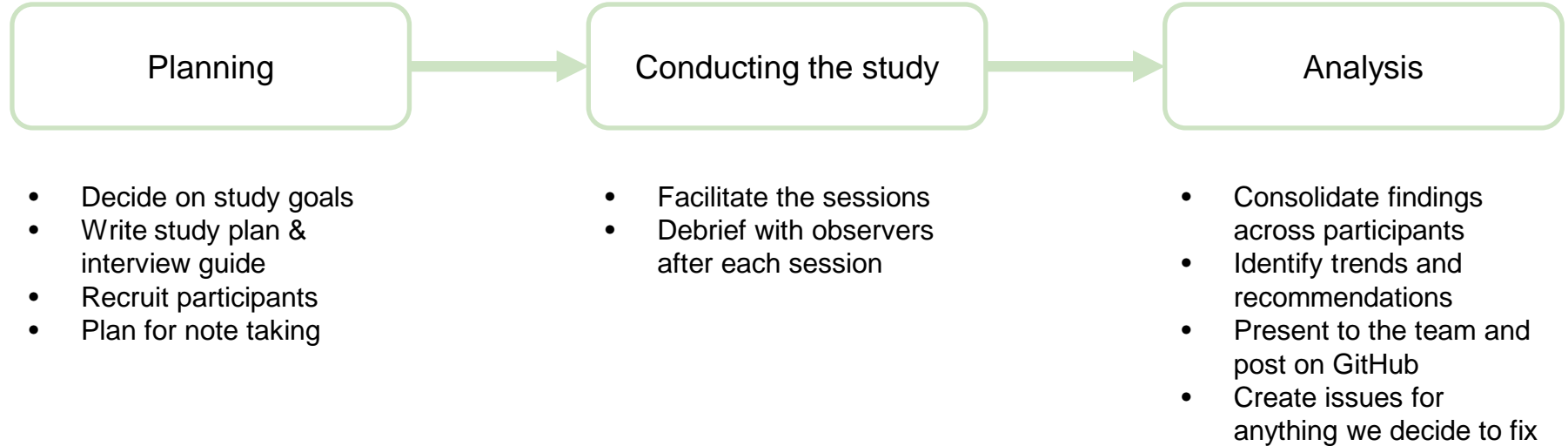
REVISED EDITION

Joseph S. Dumas
Janice C. Redish

intellect

The program analysts started by reading about user research to get the basics and hear it from the experts.

User research process





Study planning

Planning for the mock interviews

- Using the documented process, the analysts each put together a study plan to test a prototype for a new design we hadn't yet tested with users.
- The plan included goals for the study along with tasks and a recruiting strategy to meet those goals.
- They both presented their plans for feedback and then we collectively combined the best parts of both to create the version they used for the mock interviews.



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://4cawh1.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



Writing the interview guide

- The analysts then created a study guide for the user interviews using what they'd learned in their reading about crafting tasks to answer questions outlined in the study goals.
- They practiced interviewing each other to get the hang of moderating a study.



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 Resource 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 this data?
- Is production data by lease and agreement important to you?
 - Where do they fit in the process?
 - 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 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?

Tasks & Questions:

- Can you tell me a specific task you would use the data for? Can you walk me 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 add to the table?
 - Poke around and see if you can learn more about 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 should show in the table by default?
 - What does the "land owner" column tell you?
 - How would you abbreviate "Federal", "Native American" and "Mixed"?
 - What does "Mixed" mean to you for land ownership?
 - What do you think the "organize by" dropdown does? [Have them click on it and see if 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 them click on it and see if 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's the difference between "organize by" and "sort by"?
 - What does "withhold" mean to you? What do you like to see the States listed for commodities with 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?

- Can you help me find oil production in Kings County, California for 2015?
 - [Should be either on Oil or California table or on Oil California]
 - Do you like how it is organized? What would want to see different?
 - What would you want to be able to sort and organize this data by?
 - [On oil page organized by state] Is it where planning area data important to you?
 - [On California page] Is it helpful to have the number of counties listed for each county?
 - [On California Oil page] Is it helpful to have the number of operators listed for each county?
- Sparkline styling. Take user back to "Monthly" Data to show sparklines
 - What do sparklines show?
 - Does show "Monthly" data. What do bars show?
 - Which is more helpful?
- Do you know what a well number is?
 - If yes, if you had a well number, how would you find out how much production was on that well?
 - If no, explain how lease work then ask how they would find data about a specific lease
 - If they don't find it what do you think "search leases and agreements" does?
 - Is that where you thought it would be? Did the placement make sense?

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 your feedback on?
- Is there anyone else you recommend we speak with to get more insight on disbursements data?
- Thank you for your time. Your insights have been helpful to us in understanding how we might improve processes around sharing disbursements data. If there is additional information that comes to mind that you think might be helpful please feel free to reach out to myself via email.

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 are 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 designs

Prototype Menu: https://kewh1.aoshare.com/#g=1&p=explore_data



Recruiting participants

- We recruited colleagues to serve as our users.
- They were asked to role play people who fit into our typical user types, mimicking things we've seen real users do in previous studies, to give the analysts experience dealing with different users and scenarios.
- Participants also role-played common technical issues, so the analysts could get experience helping them troubleshoot.



Lessons learned during planning

- Setting clear goals is very critical to successful testing.
- It's important to create tasks that map to the goals of the study.
- There are challenges in the recruiting process (can't pay participants, low response rate, takes time).





Conducting the study

Conducting the study

- Our team is mainly remote, so we conducted the interviews via video chat.
- One analyst conducted each session and the other one took notes, so both were there for all the sessions.
- The analysts had previously been trained in taking notes for user research, since all members of our team participate in note taking.
- We conducted a debrief following each interview to make sure everything was captured, and our user experience specialist provided feedback on facilitation.



Moderation tasks

- Facilitating the study
- Communicating with the participants
- Troubleshooting technology issues for participants
- Ensuring we had a note-taker
- Coordinating the post-session debriefs



Lessons learned conducting the study

- It's important to be organized.
- It's important to be very familiar with your technology, be ready to troubleshoot and have a backup plan.
- Interacting with participants is challenging.
- It's important to observe actively.



Analyzing the findings



Analyzing the findings

- After completing the interviews, the analysts consolidated findings using a spreadsheet that maps findings into categories that we use for all our studies, identified trends across participants, and made recommendations for mitigating the issues.
- They also distilled the findings into a findings summary to share with the team.
- Our user experience specialist provided feedback throughout this process.



Analysis tasks

- 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



Findings spreadsheet

Participants	Grouping	Category	Finding	Recommendation	Priority
P1, P2, P3, P4, P5, P6, P7, P8	Data Highlights	Data Highlights	<p>Users get the interactivity on the data highlights.</p> <p>P1: Got the interactivity on Data Highlights, but was on an iPad and couldn't hover.</p> <p>P2: Got how the interactivity works on the Data Highlights.</p> <p>P3: Got the interactivity on the graphs.</p> <p>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.</p> <p>P5: Got how the interactivity worked for data highlights, but expected a tooltip treatment on rollover.</p> <p>P6: Liked interactivity on key facts and got how it worked.</p> <p>P7: Got how the interactivity on the graphs works.</p> <p>P8: Got how the interactivity works.</p>	Add interactivity to Data Highlights.	1
P2, P4, P6	Data Highlights	Home Content	<p>The Data Highlights are overwhelming and confusing to new users.</p> <p>P2: Data highlights was overwhelming for him to see up front.</p> <p>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.</p> <p>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.</p>	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

Timeframe: Yearly Monthly Year(s): CY 2015 - 2017 Organize by: Commodity Sort by: Major commodities

☐ Include rows with only withheld numbers. Download

Commodity	State/offshore region	Source	Land owner	Trend 10 years	Units	2017	2016
Oil	29 states/regions	2 sources	Federal, Native, Mixed		bbl	811,781,280	816,662,345
Gas	31 states/regions	2 sources	Federal, Native, Mixed		mcf	4,364,861,713	4,914,961,081
Coal	12 states	Onshore	Federal, Native		tons	333,452,517	309,935,534
Geothermal, direct use	New Mexico	Onshore	Federal		Millions of	143,285,366	234,254,273
Geothermal, direct use	Nevada	Onshore	Federal				

Table Organization

Finding	Recommendation
<ul style="list-style-type: none">Majority of users understood drop down menu "organized by"Drop down menu "sort by" was confusing and different options need to be explored.Users spent time performing specific tasks and were able to make several suggestions for improvements.	<ul style="list-style-type: none">Define "Operators" and explore possibility of also adding a list of payors on the leaseExplore 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.Explore options of showing more years or months by default on the table.

GitHub findings summary

Who We Interviewed

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



What We Tested

Prototype: <https://4cawh1.axshare.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 drop 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.



Lessons learned during analysis

- How to summarizing findings.
- How to organize findings by scope & severity.
- How to recommend possible solutions to issues observed.



“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





How it's going (Outcomes) One year later

DIRECT
MEASUREMENT/
OBSERVATION

EXAMINE
SHADOWS
AND

READ
THE NEWS
PAPER

RADIO

WATCH LOCAL TV

LOOK OUT
THE
WINDOW

SENSORS
ON BIRDS
RELAYING DATA
VIA SATELLITE

radar
tracking

thermometer

DIRECT USE
OF TOOLS

barometer

LOW-RESOLUTION
HISTORICAL WEATHER

TRACK CLOTHING
SPIES

COUNT
UMBRELLAS

OBSERVE ANIMAL
BEHAVIOR

PERSONAL
INTERVIEW
HOW MANY
PEOPLE YOU
APPROACH

COLOR
CHANGE
PAINT BACK
OF 1

PERSONAL

I'm a
NRRD

2 WEEKS OF WORK DATA AT THE
NATIONAL BUREAU OF THE OCEANOGRAPHY
AND MARINE SERVICE

We have increased our capacity for user research.



We've conducted 10 separate studies over the past year.



We're using the same processes to train UX interns to conduct user research to further augment our capacity.



The added capacity has allowed us to take on a second website (onrr.gov).



We're using the same processes to conduct user research on our second website.



We've started training on additional research methods and design methods like card sorting and content inventories.



Training the program analysts has resulted in greater team engagement and empathy for users by getting more of the team involved in the details.



Facilitating research has given the program analysts the ability to look at the site and our data from a user-focused perspective and they can provide more critical feedback.



We have more standardized processes now that they are documented and being repeated by multiple people.



We share what we've learned with other teams in our organization.



Next steps



Finding opportunities to train the program analysts in additional UX methods.



Thank you! Questions?



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<https://blog-nrrd.doi.gov/>



<https://github.com/ONRR/>



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