Open Science Chain UI/UX Redesign

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Project Overview

OPEN SCIENCE CHAIN

Open Science Chain is a cyberinfrastructure that uses **consortium blockchain** to document and ensure the **provenance**, **authenticity**, **and validity of scientific data**. Users can **contribute** new datasets and scientific workflows, **search** through existing data and workflows, and add to the personal **watchlist**.

TASKING

- Evaluate the current Open Science Chain website and portal, drawing from computing knowledge and understanding of design principles
- Redesign the user interface to produce a convenient user experience that is comprehensible and aesthetically-pleasing

Understanding OSC

KEY TAKEAWAYS Need for OSC

- Some studies have questionable credibility as results cannot be replicated
- Fear of lack of credit and misrepresentation with currently shared data

Relevance of Blockchain

- Credibility/accountability ensured by "append only" structure
- Consortium blockchain prioritizes scalability and security

Introducing the Open Science Chain - Protecting Integrity and Provenance of Research Data Subhashini Siyagnanan Viswanath Nandigam Kai Lin siyagnan@sdsc.edu viswanat@sdsc.edu University of California San Diego San Diego Supercomputer Cente 9500 Gilman Dr MC 0505, La Iolla, California явээшті Data. III этастос ана изретоког из дачанога хэзэктог Санаралид (PEARC '19), July 28-Андин 1, 2019, Chicaga, II., USA, ACM, New York, NY, USA, 5 pages. https://doi.org/10.1145/SSS2186.5SS2203 Data sharing is an integral component of research and academic publications, allowing for independent verification of results. Re searchers have the ability to extend and build upon prior research when they are able to efficiently access, validate, and verify the data There is a known credibility and reproducibility issue in scientifi referenced in publications. Despite the well known benefits of makresearch [2, 7-9, 11, 12, 14, 20, 21, 25] that is a direct consequence of low research data sharing rates. The credibility of the research ing research data more open, data withholding rates have remained constant. Some disincentives to sharing research data include lack findings comes into question when the results cannot be replicate with limited available data or when data is not made available at articles are replicable due to various reasons including modifies funded Open Science Chain, a cyberinfrastructure platform built almost 90% of microarray studies from a leading genetics journa re not fully reproducible, mostly due to incomplete availability of Facilitating the future reuse of data in a secure and indeper dently verifiable manner is critical to the advancement of research Realizing the importance of making research data available for th Information systems → Data provenance: Interest community, several funding agencies now require that the data be made available/post research phase/in order to increase confidence and trust in the research work [17, 18] and to enable reusability Data Reproducibility, Data Provenance, Data Integrity, Cryptogra phy, Blockchain, Distributed Ledger Technology with the availability of third party data repositories encourage sharing of research datasets. However, a cross-sectional study of ducing the Open Science Chain - Protecting Integrity and Provenance of data sharing and withholding in the life sciences shows that the sease termission to make digital or hard copies of all or part of this work for personal o intellectual property [6], protecting scientific lead [26], and fear of srepresentation or misuse of data, especially if the provenance While there are several research data sharing renositories (e.g.

figshare, Dryad Digital Repositors) that founs on making research data available, there are no syberinfrastructure (CI) platforms that

Preliminary Website/Portal Review

Recreated usability testing/focus group structure

- Conducted first-look of website and portal with team
- Accurate representation of first-time user navigating website
- Allowed for identification of features to improve and highlight

Open Science Chain UX Feedback

PORTA

General

- OSC logo in top purple bar is stretched out
 Could add Contribute subpage (redirects when you click on Contribute)
- Could add Contribute subpage (redirects when you click on Contribute)
 Could add My OSC subpage

Search/Homepa

- Remove current "Data" / "Workflow" titles on each card → Put large "Data" title in top left of Recent datasets section (do same with workflows)
- Add Filters button (for sorting by date, keywords, display settings, etc)
 Search results: bold + increase size of Title
- Remove Workflow/Data bubbles in search results → put "WORKFLOW" / "DATA"
- Left-align Details button with text entries
- Make links clickable only able to access through arrow buttor
- Title cards: Author, title, description
- Advanced search options through title, description, author
- My OSC My Watch List
- Left align buttons with text entries
- Bold + increase size of Title

VEBSITE

Remove stock photos and replace with simplified design/icon for platform and portal → ex. Icon of tracking/connecting lines and icon of people collaborating/checkmarks to

represent verification About - Menu Bar

- Decrease width of Citing OSC tab under Publications

About - Student Projects

- Reduce spacing between title and content

Make github links clickable

- Update with content?

- Add spacing between event entries + format dates to be bold
- Add upcoming/past event sections

Resources - User Guide

 Redo picture in step #6 in registering data guide - screenshot pop-up in bottom of current photo

OVERALL *focuses more on Ul/aesthetics, slightly lower priority

Develop consistent color scheme between portal site and main webpage

Develop consistent color scheme between portal site and main webpage
 Identify fonts + make consistent across both sites (assign title, subtitle, main text fonts)

Website Features + Design Principles

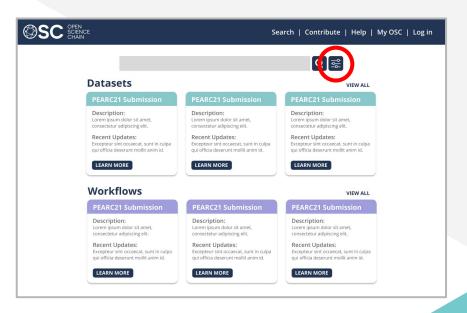
Filter Button (next to Search Bar)

PURPOSE

Choose to display datasets and/or workflows, search for keywords in specific fields (contributor, description, OSC data)

80/20 RULE

Amplify the critical 20% of features being used 80% of the time → optimizes design, focuses resources and attention



Website Features + Design Principles

Information Icons

PURPOSE

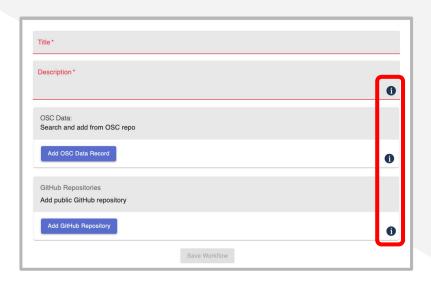
Learn more about certain features and required entries, to be utilized in data/workflow contribution processes

LEVEL OF CONTROL

Users should exercise a level of control based on their proficiency and experience with the system \rightarrow range of users is expanded

GESTALT PRINCIPLE OF PROXIMITY

Objects that are closer together are perceived as belonging together → inline help buttons with meaningful symbols improve usability



Website Features + Design Principles

Encompassing Design Principles (used site-wide)

CONTOUR BIAS

Objects with contours are favored over those with points → elicits positive emotional and aesthetic impression, avoids fear response from viewing sharp angles

CONSISTENCY

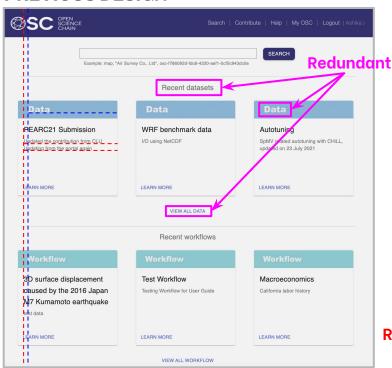
Similar parts are expressed in similar ways → improves usability, transfers knowledge to new applications

ALIGNMENT

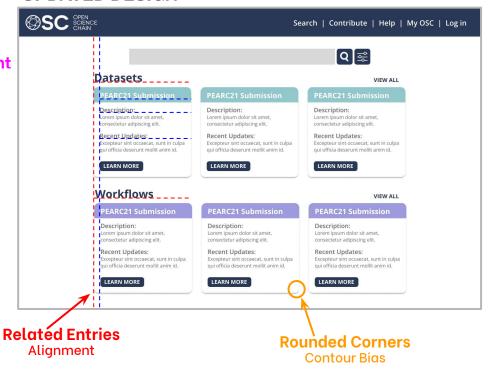
All text elements and icons are left-aligned → contributes to readability and aesthetic

Homepage Comparison

PREVIOUS DESIGN



UPDATED DESIGN



MY OSC: MY CONTRIBUTIONS

(UPDATED)

MY OSC: MY WATCH LIST

(UPDATED)

WORKFLOWS DATASETS	WORKFLOWS DATASETS
workstow. 3D surface displacement caused by the 2016 Japan M7 Kumamoto earthquake	WORKFLOW 3D surface displacement caused by the 2016 Japan M7 Kumamoto earthquake
Description: Vorem ipsum dolor sit amet, consectetur adipiscing elit.	Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit.
OSC Data: Excepteur sint occaecat, sunt in culpa qui officia deserunt moliit anim id.	Contributor: Excepteur sint occaecat, sunt in culpa qui officia deserunt mollit anim id.
	OSC Data: Excepteur sint occaecat, sunt in culpa qui officia deserunt mollit anim id.
HISTORY VIEW	HISTORY VIEW UNWATCH
WORKFLOW. ED surface displacement caused by the 2016 Japan M7 Kumamoto earthquake	WORKFLOW 3D surface displacement caused by the 2016 Japan M7 Kumamoto earthquake
Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit.	Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit.
OSC Data: excepteur sint occaecat, sunt in culpa qui officia deserunt moliit anim id.	Contributor: Excepteur sint occaecat, sunt in culpa qui officia deserunt mollit anim id.
	OSC Data: Excepteur sint occaecat, sunt in culpa qui officia deserunt mollit anim id.
HISTORY VIEW	HISTORY VIEW UNWATCH
	A
General L	_ayout / Purple for Workflows /

Looking Ahead

CURRENT IMPLEMENTATION

Visual Studio Live Server extension to test HTML files and visualize changes locally.

FUTURE CONTRIBUTIONS

Improve general opensciencechain.org website, reflecting changes from mockups.

Set up blockchain components and OSC portal locally to implement changes for portal website.

Thank You

MENTORS

Subhashini Sivagnanam Viswanath Nandigam Scott Sakai Kai Lin