Designing DataVis: A visual tool for engineers

Andrea Fallas, UX Architect
December 2017
The project

The process
The project

What we did
The project  Client and context

1600+  Books & resources

200,000  Page views per month

McGraw Hill Education

ACCESS Engineering

Authoritative content. Immediate solutions.
The project Customer base

Students

Faculty

Professionals

Libraries
- Academic

Libraries
- Corporate
The project Goals and needs

Business goals

User needs
The project Initial insight

Librarians: We want a material properties data search.
The project Further insight

Librarians:
We want a material properties data search.

Faculty:
We don’t need a data search
– most material properties data is freely available online.
The project User needs

Students

Faculty

Professionals
The project User needs

I need to explore materials and their properties so I can understand the meaning of material property data in context of engineering design.
The project User needs

I need to help students understand concepts and relationships so they can become successful professionals.
I need to find appropriate materials for my intended application.
Designing an aeroplane

An example of using DataVis
Materials need to be:

Lightweight

Strong
Materials need to be:

- Lightweight
- Strong
Materials need to be:

- Lightweight
- Strong
Materials need to be:

Lightweight

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Materials need to be:

- Lightweight
- Strong
The process

How we did it
The process What we planned

| Concept | Prototype | Market test | Scope requirements | Build |

Discovery & definition

Development & delivery
The process  What we did

Discovery & definition  Development & delivery
The process  What we did

Discovery & definition
The process What we did

Discovery & definition
The process Who was involved

- Faculty
- SMEs
- McGraw-Hill Education
- Visualisation SME
- HighWire Brighton
The process  How we worked

Faculty  SMEs

McGraw-Hill Education

Visualisation SME

HighWire Brighton

Fostering collaboration across continents

- Real-time conversations
- Frequent demonstrations
- Agile methodology with quick cadence
The process Design challenges

Make complex features easy to use

• Support a range of subject matter expertise
• Support first-time, occasional and power users

Integrate DataVis into AccessEngineering

• Allow seamless access
• Maintain platform performance
• Develop distinct yet integrated brand / identity
Data-centric to user-centric

Landing page evolution
Landing page
not defined
Explore material properties

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Find materials, properties or groups e.g. aluminium, density, physical

**Materials**
- By classification
- By structure
- By process

**Properties**
- Property group
- Property group
- Property group
- Property group

**View showcase documents**
- Showcase document title
- Showcase document title
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**Visualize these**

- Materials
- Properties

- Visualize
- Reset
Explore material properties

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Choose materials  Choose properties

Showcase documents

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Showcase document title
Explore material properties

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Exploring all materials and 0 properties

Choose materials  Choose properties

Showcase documents

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View all showcase documents
## Explore material properties

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- Get started
- Look up a value
- Get started as an advanced user

## Showcase

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<thead>
<tr>
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View all
Iteration 5

Explore material properties
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Get started

Look up a property value

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View all
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Tools and a curated database of engineering materials and their properties. Explore, compare, visualize, select, create.

Explore material properties

Look up a property value

Showcase

Showcase document title
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View all
Explore the DataViz database of materials and their properties.
Find and compare materials using our visualization tool, then save your work and share with others.

- Compare properties across multiple materials
- Look up a property value for a single material

Sample visualizations:
- Mechanical Properties of Metals: Visualizations illustrating the various mechanical properties for metals
  View Visualization
- Bicycle Case Study: Visualizations that can be used to select appropriate materials for building a bicycle based on their material properties
  View Visualization
- Comparison of Physical Properties: Visualizations illustrating the comparison of physical properties across different categories of materials: metals, polymers, ceramics, composites and advanced materials
  View Visualization

View all sample visualizations

\[\text{iteration 7}\]
Iteration 8
Iteration 9

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**Sample visualizations**

<table>
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View all sample visualizations.

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Sample visualizations: Get started with one of our sample visualizations or take a look at our video tutorial on tips for how to use this tool.

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View all sample visualizations

Iteration 12
Iteration 13
Iteration 15
Welcome to DataVis!

Get started with our video tutorial or use one of the DataVis projects below. These faculty-created, active learning projects can be used as-is, or copied and customized for your own course.

DataVis Project Library

**Materials: More than a Name**
This project investigates materials with similar names (aluminum, aluminium, aluminimum (except Al), focusing on the fundamental differences between them. Designed by Dr. Susan J. Gentry, University of California, Davis.

Open Project

**Influence of Material Properties**
This project investigates the influence of material properties in basic analysis and design for a first course in Strength of Materials. Designed by Luke Lee, University of the Pacific.

Open Project

**Properties for Aerospace Structures**
This case study looks at properties for Aerospace applications. Designed by Kathleen Kitts, Western Washington University.

Open Project

View all sample visualization projects

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Seamless access
Integrated identity
Key user tasks
Example applications
Help for new users
Launched **on time** in July 2016

Received **positive feedback**

Won a **2017 PROSE award**

“I like **how easy it is** to compare and contrast the properties”

“[DataVis] helped me better understand the differences in the materials”
Thank you.

bit.ly/mhedatavis