



Release your creativity on your company laptop

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Agenda

- “There must be a better way of doing this”
- What you need is already on your laptop
- Demo – Release your creativity
- Summary

Disclaimer

- Any interface you see will most likely look terrible
- I only care about data
- And this talk is all about data

SDTM Annotated CRF

X

Y

Demographics			
Date of Informed Consent	DSSTDTC where DSDEOCD='INFORMED CONSENT OBTAINED'	RFICDTC	[itmICPDAT] Req / Req / Req (2016-2020)
Date of Birth		BIRTHDTC	[itmBRTHDAT] Req / Req / Req (1900-2017)
Age [read-only]		AGE	[itmAGE] 1 <= N3 <= 199 years
Age Unit [hidden]		AGEU	[itmAGEU] A10
Gender		SEX	[itmSEX] [A:MALE] ☐ Male [A:FEMALE] ☐ Female
Race		RACE	[itmRACE] [A:CAUCASIAN/WHITE] ☐ Caucasian/White [A:BLACK OR AFRICAN AMERICAN] ☐ Black or African American [A:ASIAN] ☐ Asian [A:NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER] ☐ Native Hawaiian or Other Pacific Islander [A:AMERICAN INDIAN OR ALASKA NATIVE] ☐ American Indian or Alaska Native [A:OTHER] ☐ Other [itmRACECOMP] ☐ Other [itmRACEOTH] Specify Other Race A200 QVAL where SUPPDM.QNAM='RACEOTH'

```
><freetext color="#BFFFFFFF" page="4" rect="90,690,220,705" subject="Text Box" title="Process"
><contents-richtext
><body style="font-size:11.0pt;text-align:left;color:#000000 ;font-weight:bold;font-
family:Helvetica;"
><p dir="ltr"
>DM = Demographics </p
></body
></contents-richtext
```

Does a data point have an address?

		Columns				
		1	2	3	4	5
Rows	0	STUDYID	USUBJID	INVID	AGE	AGEUNIT
	1	STUDY1	SUBJ01	INV01	36	YEARS
	2	STUDY1	SUBJ02	INV01	45	YEARS

STUDYID	USUBJID	QNAM	QLABEL	QVAL
STUDY1	SUBJ01	NO	MORE	Non Standard Variables

- What is the address to the value 36?
 - Coordinates – Row:X Column:Y
 - (1,4) Row: 1 Column: 4
- What is the address to the “label” AGE?
 - (0,4)
 - Row 0 is a presentation trick
(It is metadata)
- Never want to create a NSV variable again

- I want precision in my data
- And be able to manage complexity

“There has to be a better way”

Race [Race]	☐ American Indian or Alaska Native ☒ Asian ☐ Black or African American ☐ Native Hawaiian or Other Pacific Islander ☒ White
----------------	--

DM	SUPPDM	SUPPDM
RACE	RACE1	RACE2
MULTIPLE	ASIAN	WHITE

```
{  
  'subject': 'SUBJ01'  
  'race': ['ASIAN', 'WHITE']  
}
```

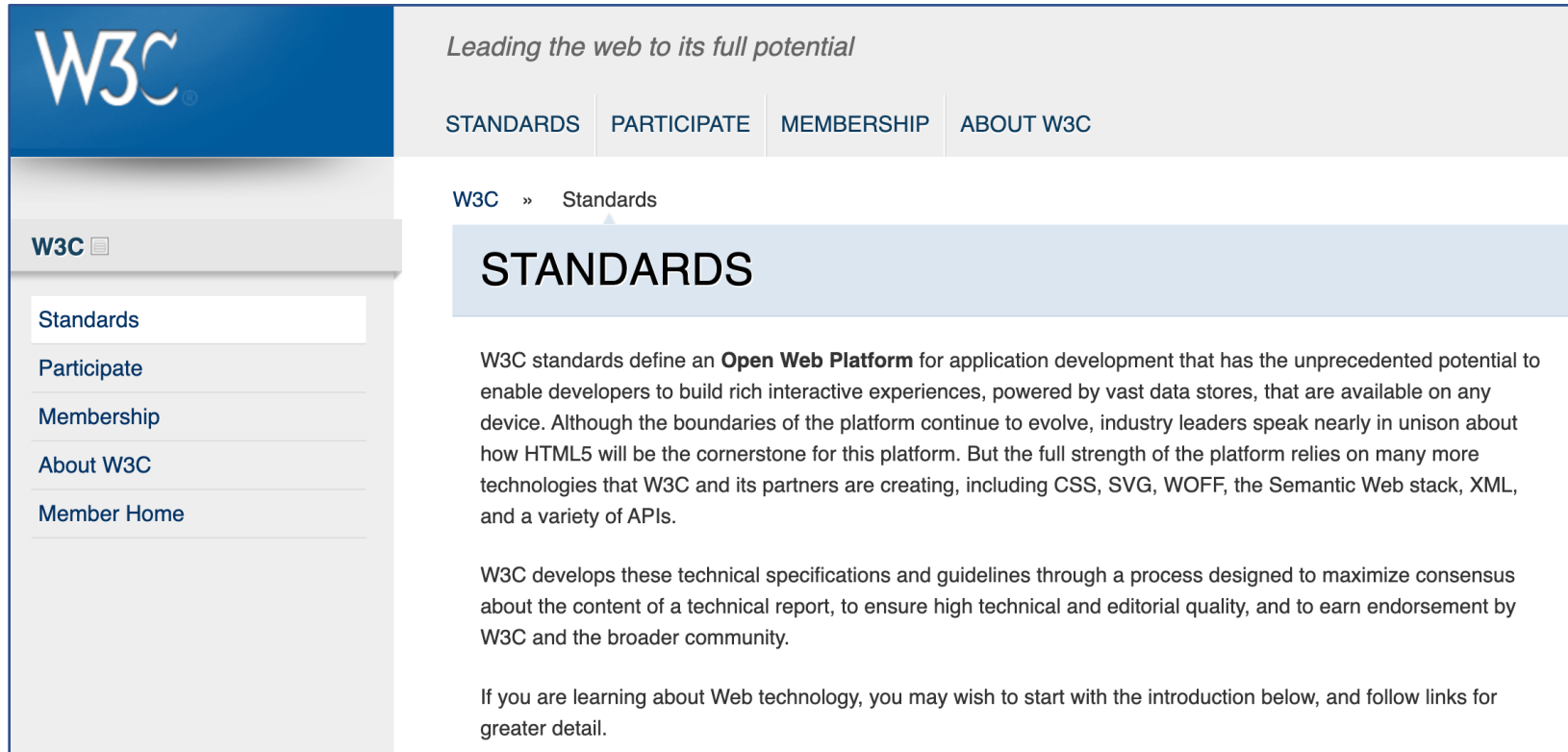
What you need is already on your laptop

The image shows a web application interface for 'phuse' with a teal header and navigation bar. The navigation bar includes links for 'WORKING GROUPS', 'EDUCATION', 'COMMUNITY', and 'EVENTS CALENDAR'. The main content area features a large blue banner titled 'The Global Healthcare Data Science Community' with the subtitle 'Sharing ideas, tools and standards around data, statistical and reporting technologies'. To the right of the banner is a globe illustration with various icons. A tooltip over the banner indicates the element is 'div.mission-blocks__headlines' with dimensions '578 x 186.85' and is a 'Flex Item'. On the right, the browser's developer tools are open, showing the HTML structure. The selected element is 'div.mission-blocks__headlines' within a 'div.mission-block' container. The HTML structure includes a header, main content area, and footer. The developer tools also show the 'Layout' tab with a 'Flex Item of div.mission-block' and a 'div.mission-blocks__h...' element.

```
<!DOCTYPE html>
<html lang="en">
  <script id="__gaOptOutExtension" type="text/javascript"></script>
  <head>
    </head>
  <body>
    <div id="root">
      <div class="App">
        <header>
          </header>
        <div class="content">
          <main>
            <div class="container">
              <div class="mission-block">
                <div class="mission-blocks__headlines">
                  <div class="mission-block_img">
                </div>
              </div>
            </div>
            <div class="container">
              </div>
            <div class="subscribe-block">
              </div>
            <div class="container video-block">
              </div>
            <svg class="circle-icon circle-icon__main-page">
              </svg>
            </div>
          </main>
        </div>
        <footer class="footer">
          </footer>
        </div>
        <svg class="svg-sprite">
          </svg>
        </div>
      <script>
        <script src="/static/js/2.450413cf.chunk.js">
        <script src="/static/js/main.d0c4a883.chunk.js">
      </script>
    </body>
  </html>
```

Might need to store it on a cloud drive

It's all standards ...

A screenshot of the W3C (World Wide Web Consortium) website's 'STANDARDS' page. The page has a blue header with the W3C logo and the tagline 'Leading the web to its full potential'. Below the header is a navigation bar with links for 'STANDARDS', 'PARTICIPATE', 'MEMBERSHIP', and 'ABOUT W3C'. The main content area is titled 'STANDARDS' and contains a paragraph explaining that W3C standards define an 'Open Web Platform' for application development, mentioning technologies like HTML5, CSS, SVG, WOFF, and XML. It also describes the process of developing these standards through consensus. A sidebar on the left contains links for 'Standards', 'Participate', 'Membership', 'About W3C', and 'Member Home'.

W3C

Leading the web to its full potential

STANDARDS PARTICIPATE MEMBERSHIP ABOUT W3C

W3C » Standards

STANDARDS

W3C standards define an **Open Web Platform** for application development that has the unprecedented potential to enable developers to build rich interactive experiences, powered by vast data stores, that are available on any device. Although the boundaries of the platform continue to evolve, industry leaders speak nearly in unison about how HTML5 will be the cornerstone for this platform. But the full strength of the platform relies on many more technologies that W3C and its partners are creating, including CSS, SVG, WOFF, the Semantic Web stack, XML, and a variety of APIs.

W3C develops these technical specifications and guidelines through a process designed to maximize consensus about the content of a technical report, to ensure high technical and editorial quality, and to earn endorsement by W3C and the broader community.

If you are learning about Web technology, you may wish to start with the introduction below, and follow links for greater detail.



- HTML
- SVG
- XML
- JavaScript
- JSON
- CSS
- RDF
- etc.



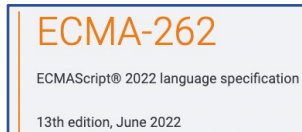
... designed to work together

Quick intro

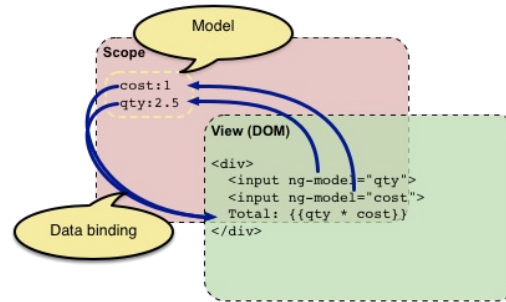
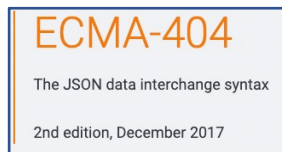
- HTML



- JavaScript



- JSON



```
<!DOCTYPE html>
<html>
<body>
  <h1>Protocol</h1>
  <p>This is a protocol.</p>
  <table border="1">
    <tr>
      <td>Height</td>
      <td class="result" data-a="result">hello1</td>
      <td>unit</td>
    </tr>
  </table>
</body>
</html>
```

- Find things

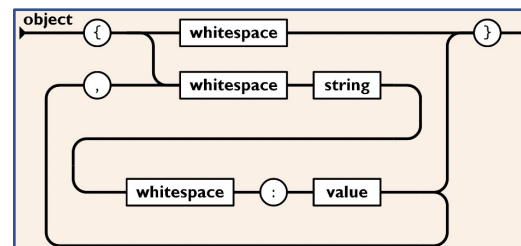
```
found = document.getElementById('a')
```

- Loop

```
found = document.getElementsByClassName(result)
for (const element of found) {
  element.innerHTML = "The brown fox"
}
```

- Add/Remove/Update

```
element.append(new_element)
element.remove()
element.dataset.id = "XYZ-001"
```



```
{
  "study": {
    "name": "STUDY01",
    "subjects": [
      "subject": {"id": "SUBJ01", "race": ["ASIAN", "WHITE"]},
      "subject": {"id": "SUBJ02", "race": ["ASIAN"]}
    ]
  }
}
```

The mission: Release creativity

- Create a data structure that supports:
 - Visualising as a form
 - Collecting data
 - Automates SDTM annotation
 - Viewed as SDTM without loss of information
 - Without changes to the structure itself
- If it works:
 - It has precision
 - Can manage complexity of information

Plan – for content

```
"FIRST_DATA_TEMPLATE": {
  "identifier": {
    "name": "SYSBP",
    "display": "Systolic Blood Pressure, Supine"
  },
  "result" : "",
  "unit" : {"C12345": "mmHg"},
  "location": [
    "SPONSOR-LOC1",
    "C32141",
    "C32974",
  ],
  "position": {
    "C131313": "Supine"
  }
}
```

← No value. Only placeholder for result

← Include sponsor terminology

← Implicit “link” to identifier

Plan – for display

```
"FIRST_DATA_TEMPLATE": {  
  "identifier": {  
    "name": "SYSBP",  
    "display": "Systolic Blood Pressure, Supine" ← Question text  
  },  
  "result" : "",  
  "unit" : {"C12345": "mmHg"},  
  "location": [  
    "SPONSOR-LOC1",  
    "C32141",  
    "C32974",  
  ],  
  "position": {  
    "C131313": "Supine" ← Single item = Fixed value. Can't be changed  
  }  
}
```

Plan – collecting data

```
"FIRST_DATA_TEMPLATE": {  
  "identifier": {  
    "name": "SYSBP",  
    "display": "Systolic Blood Pressure, Supine"  
  },  
  "result" : "110",  
  "unit" : {"C12345": "mmHg"},  
  "location": [  
    "SPONSOR-LOC1"  
  ],  
  "position": {  
    "C131313": "Supine"  
  }  
}
```

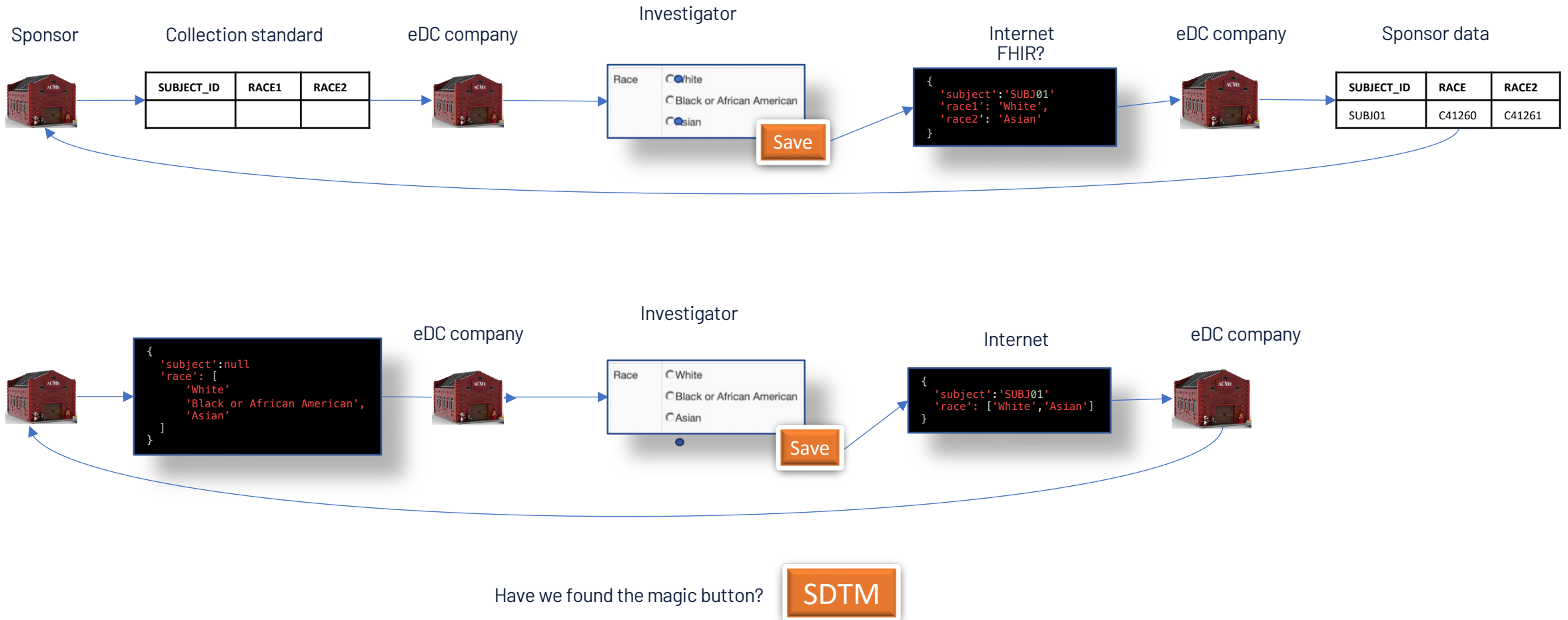
Collected result added

Only contains the selected value on the form

Demo

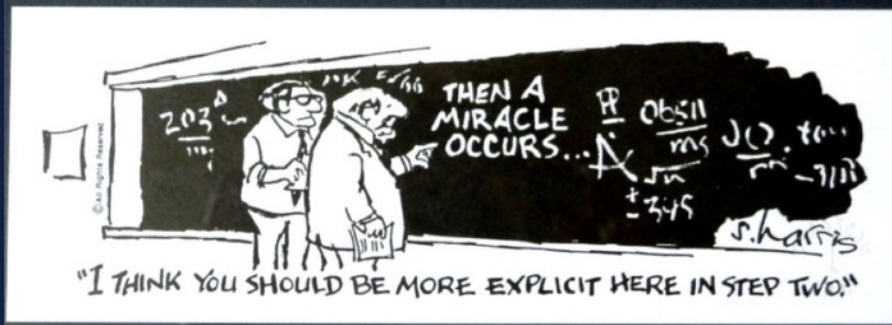
The background is a dark blue gradient with various geometric elements. On the left, there is a network of small circles connected by thin lines. In the center and right, there are larger, glowing yellow circles and lines radiating from a bright yellow point at the bottom right. Scattered throughout are several 3D cubes of varying sizes and orientations. Faint plus signs and dashed lines are also visible in the lower portion of the image.

Collecting data



Summary

- A web browser is all you need to test an idea
- The web has useful interoperable open standards
 - W3C standards open up a new way of thinking and working
 - E.g. JSON can serves multiple purposes
 - More detailed representation of data and relationships
 - Almost as good as Linked Data/Graph databases
- We make work more complicated than it is!
- Have fun!



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Thanks for listening

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