Final Dashboard Memo: The Datastory of a Product

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Link to Dashboard: http://stanford.edu/~kaylamg/NSC/Dashboard.html

Datastory

The scrolling visual I created is meant to communicate that many parents face a similar challenge in trying to figure out what to do with the copious amount of artwork their children produce. Our solution is a compelling way to help children continue to feel encouraged to make art, help parents celebrate art, and reconcile sentimentality of childhood mementos with the practicality of art storage. Ideally, the infographic would be viewed by the product target audience, parents of children 4-8 years old, and they would be inspired to buy it.

Data

The data I used for the visualization are located in appendices A through C at the end of this paper. Most of the data came from an independent survey I created to learn more about the stakeholders of the capstone project I am working on, the project this visualization was based on. Although I asked both qualitative and quantitative questions on the survey, I only used the quantitative measures when creating my dashboard because they presented a more clear datastory. In the future, gathering more data and finding an integrated way of adding the qualitative data would be a good way to continue this project.

The second data set I used was population data of children in the United States broken down by age group. I used the data for 5-11 year olds from the set because it was the closest group to our target market of 4-8 year olds. Finally, for the other graphics in my visualization, I cited research from several research papers.

Data Management

In creating the final graphic I used two tools: Tableau and Sketch. Tableau, a data visualization software, is a great data exploration tool and I used it for the US population data set I found online. It took me some time to figure out how to filter out the data I did not want as well as decide what type of chart looked best, but I am confident that the final line graph is clear and concise.

Sketch, in contrast, is a much more open ended tool than Tableau, similar in function to Adobe Illustrator. Sketch was enormously useful in allowing me to create icons and pictures as well as creatively format all the different elements. For example, I was able to easily make the

first chart by plugging in proportional values for shape sizes. Sketch was also particularly useful because I was working with such a small data set from my survey data.

Iteration & Design Rational

When I began the final project for this class I had a pretty clear idea of the big idea I wanted to convey: that parents had a problem around art storage and we had designed a product to help fix the problem in a meaningful way. While my initial dashboard wireframes reflect this, they lack the clarity I developed as I further simplified the amount of information I gave the audience at a time.

Figure 1.1: Annotated narrative arc with symbols that map onto Figure 1.2.

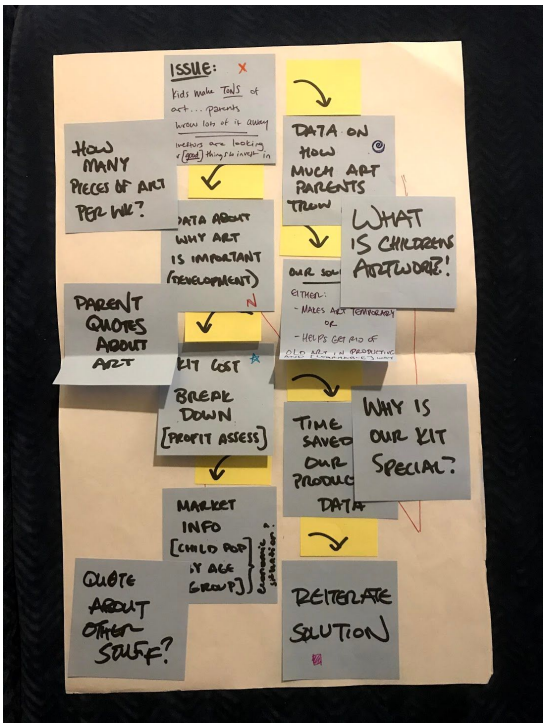

Figure 1.2: First wireframe prototype.

My first wireframe prototype (Figure 1.2), is a map of the elements I initially thought I wanted to include in my visualization. Developed using a narrative story arc, I thought about my datastory as a rags to riches plot, where the target audience starts with a conflict and is able overcome it. From this prototype I learned that following a narrative arc would help clarify my intention and I started to decide what order would make the most sense for my datastory. We also had a round of in-class feedback for wireframes and my peers helped me realize that I would need to make sure the flow was clear and there were clear connections between each piece of information. The next three prototypes I made (Figures 1.3-1.5) were digital mockups.

Figure 1.3: One-page dashboard prototype.

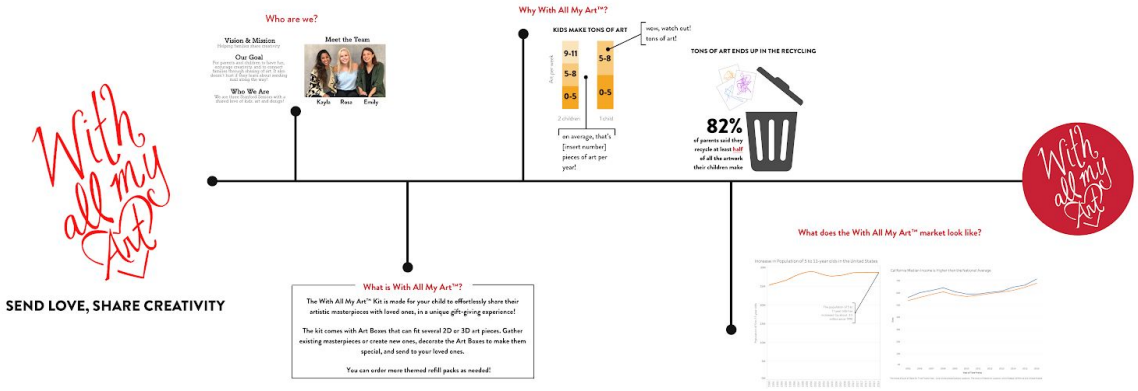

Figure 1.4: Timeline dashboard prototype.

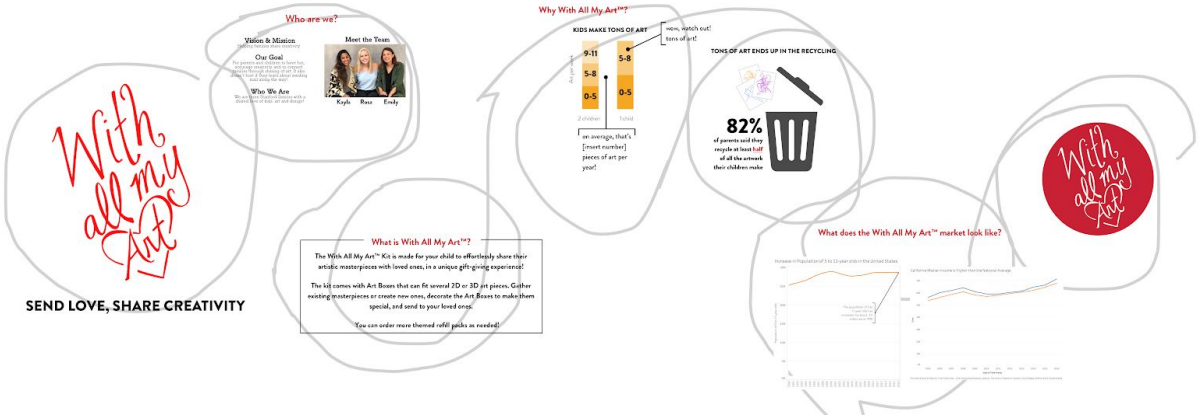

Figure 1.4a: Timeline dashboard prototype with “scribbling” effect to further represent the child-centric nature of the project.

After creating three digital mockups, I narrowed down to one idea that (the class and) I liked the best and was able to gain insight into what an audience might think with another round of in-class peer review. Figure 1.5 shows the layout I chose to continue with. The scrolling, downward motion of the graphic seemed like the best flow of information and I liked the idea of using scrolling as a way to engage the audience in the story.

Class feedback was particularly helpful at this stage of visualization design. One peer brought to my attention that my intended audience wasn’t clear and as a result my point was muddy. Based on this feedback I decided to shift my audience from potential investors, for which I really didn't have enough data, to people who might want to purchase the product. Other peers reminded me to include data sources, declutter graphs, use colors more intentionally, and encouraged me to continue with a linear progression that made the datastory easy to follow. What followed was a rapid new process of design iterations that attempted to address all the feedback I had received in a revised graphic.

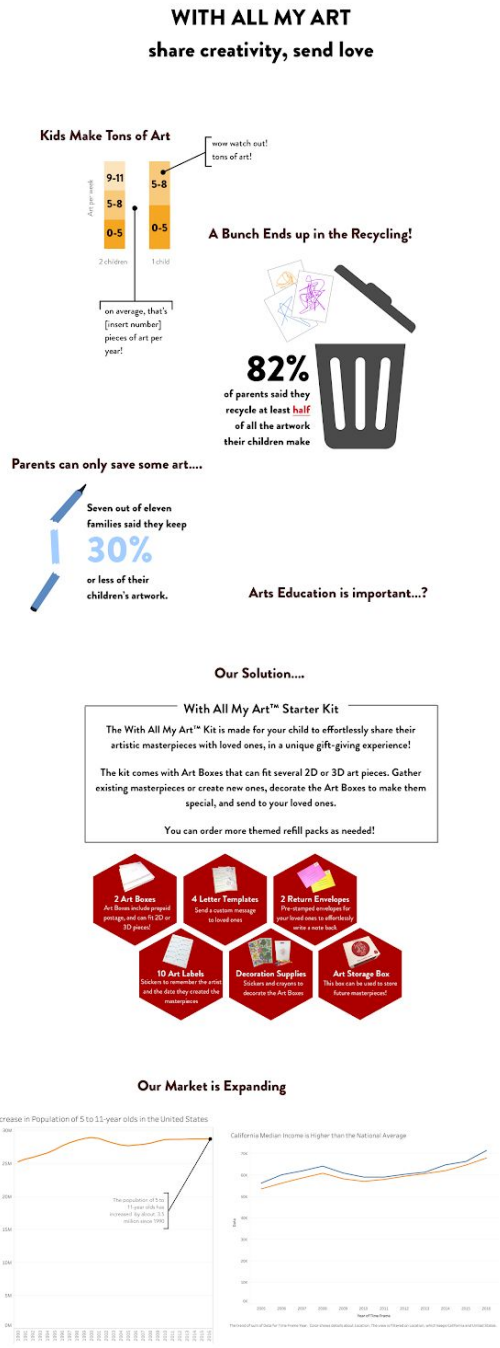

Figure 1.5: Scrolling dashboard prototype.

My final visualization is a result of many design decisions and iterations. I am very happy with the way it turned out but also know there is always room for further improvement.

One of the first, most important elements in my final visual is color. Each section in the infographic is delineated by a different color that helps the audience sort all the data I present. I was very intentional with the size of each colored section and wanted to give the viewer just enough to see as they continued to scroll. I used a light color for the background and a darker version of the same color for important elements to be visually consistent and thought it worked well in highlighting the essential point in each box.

The color organization also aided me in reflecting on clutter and chartjunk. Once I was able to see what the most important ideas of the graphic were, I could get rid of any information that was not helping my audience understand the main point. For example, I deleted the second demographic graph I had in my prototypes because it did not highlight the big idea and after cleaning it up, I was able to vastly improve the second chart by clarifying the purpose.

For this project I used a stacked bar chart, a line graph, and large number call outs. All three of these chart genres are fairly straightforward (especially since I didn't use more than two axes on any of them) and based on my audience, I wanted my graphic to feel friendly and simple. Moreover, I wanted the perceived cognitive load and the actual cognitive load to be low. Asking the audience to scroll through something made me very aware of how engaged they would need to be in order to continue through the entire infographic. The stacked bar chart was a simple comparison tool and made much more sense than a normal bar chart in terms of space and readability. The line graph was more of a challenge because it lacked contextual relevance without the right title or annotations. I decided to add an explanatory explanation of the growth on the chart as well as one next to it to clarify the purpose: that there are millions of families just like yours, probably looking for a solution to the same problem. Finally, the large, colorful numbers surrounded by text were mainly products of choosing the right figures to call out. I had a few other quantitative measures from the survey I conducted that I could have also added, but I decided not to because they did not contribute to the datastory. The numbers I did choose, for example that "seven out of eleven families said they keep less than 30% or less of their children's artwork," were representative of the survey, relevant to the infographic and informative to the audience.

Pictures and icons are another defining part of my work. I made all the iconography for a consistent look. Based on our class readings, everything works together in helping the audience remember the important information and the graphic overall. The number call outs are strong alone, but adding in the pictographs helps make the ideas concrete. Case in point, the art falling into the trash can in the third pane serves to drive home the idea that a lot of art is actually getting discarded and to remind parents how bad it can feel to watch their kids' work fall into the trash. Other icons sum up main ideas into quick visual indicators and make the design feel complete.

The most important part of the visualization, the call to action, presented a great opportunity to point the audience to the product but also raised some interesting ethical questions. Because the actual product I am creating a graphic for is not quite finished yet, I currently have a placeholder for a real actionable item. However, eventually I would want a way for users to be directed to purchase the product. Being in the unique position of designing a graphic with the intention of selling something to the audience made me think a lot about the ethics of my visualization. Was I leaving anything out in order to convince people this product was necessary? Is any of my information skewed to make the product seem more attractive? Overall, I feel good about what I created especially because I included sources for my research and data sites and because I was careful not to distort information, but I think I will continue to reflect on how much or how little information is ethical.

In summary, I don't think Knafflic would be too displeased with my visual. My charts are simple, my purpose is clear and I provide enough contextual information to orient the audience to the subject. Tufte, a much bigger proponent of providing the audience with a question or point to ponder over, compared to Knafflic, might not be quite as excited about my work, but I don't think he would complain about the multivariate data, the integration of evidence or the clarity & relevance the infographic provides.

What I Learned

This class has taught me an enormous amount about data and applying visual techniques to convey information. Although I had already had exposure to many visual design principles, the class was incredibly informative in instructing me on how to craft an effective, ethical and memorable datastory. I now recognize the connotation of evidence and integrity that data carries with it, even if a datastory does not contain those elements. Additionally, this class has given me the language I need to describe why certain visualizations are well crafted or poorly designed.

One of the most important, if not the most important, part of this class for me was looking at examples of other visualizations and discussing what was effective and ethical and what was not. Although our class was very critical, even of professionally done visualizations, I got a lot out of hearing what the class viewed as important or miscommunicated. I also learned that even an excellent visualization may not be able to please everyone, but if it is contextualized and thoughtfully made it can still convey an important point to the audience.

I knew coming into this class that visual communication was important but in practicing creating visualizations and participating in lecture, just how essential it is was cemented over the course of ten weeks. The rhetoric of data is often so absolute but in constructing a datastory one learns about how subjective even numbers based in fact can be. I really enjoyed our in-class activities. Trying to make a visualization quickly, iterating through prototypes, and doing other warm-ups was helpful in forcing us to pick what was important and draw it out. As

we moved toward the final project I had a better and better idea of what a datastory should be based on experience.

When I become a designer in industry I will certainly apply everything I have learned in this class frequently. As a designer I feel as though I am expected to not only tell effective stories, but also visually effective stories. And I'm certain that wherever I go there will be vast amounts of data as well as people who will ask me to use it for particular purposes. Knowing how to explore and apply data is going to be essential. I am also excited to find things in data that I don't expect. Our practice with the Mother Jones dataset was one of my favorite parts of the class because it presented an opportunity to find something new. Going into a data set as an objective explorer is both an adventure and a duty.

This course fit with my degree and my path in NSC better than I thought possible. Visual communication has been an interest of mine since before I began my college career and learning how to transform vast amounts of information into something that people can understand in seconds aligns perfectly with my interests and other skills.

Appendix A: Parent Survey

Link to spreadsheet of survey data:
https://docs.google.com/spreadsheets/d/1QIboZ0cwMf-hc8fNx_zX760Gv2CJrhccRHfK4YgRSxE/edit#gid=1313841126

Link to front facing survey form:
https://docs.google.com/forms/d/e/1FAIpQLSe9I-I8ypXgCltn7I6mfMJBunmGNNvcPavhw5Zib7p738Ltaw/viewform

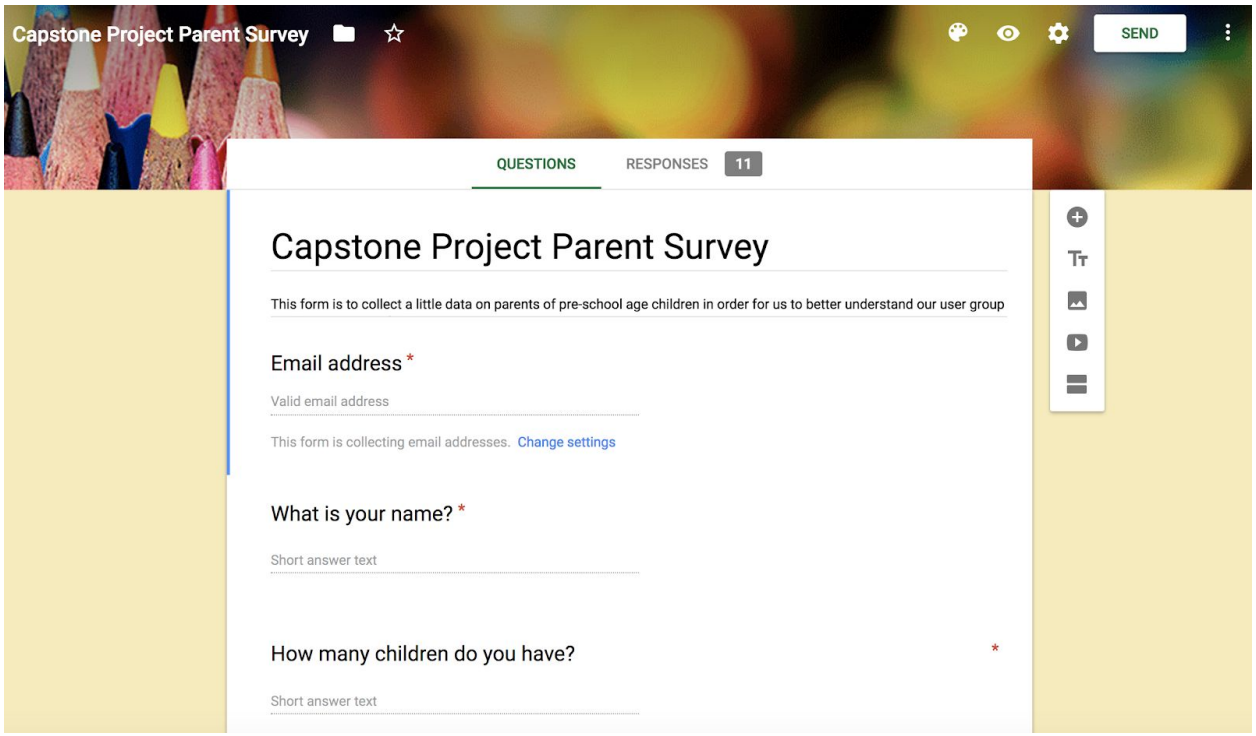

Figure A.1: Screenshot of parent survey.

How many children do you have?	How many pieces of art do you think all your children produce per week on average? (if more than 12, how many?)	How much art per child per week?	On a scale of 1 to 10 how much of your children's art do you think you recycle/throw away?	On a scale of 1 to 10, how much of your children's art do you think you keep or plan to keep long term?	On a scale of 1 to 10, how much of your children's art do you think is made at school/camp/other places outside your home?	On a scale of 1 to 10, how much of your children's art do you think is made in your home?
2	0-10	0-5	50%	25%	75%	25%
1	4-6	4-6	1	10	7	3

2	7-10	3-5	9	2	8	3
2	15 ish	7 ish	8	2	4	6
2	7-10	3-5	2	8	7	3
2	0-3	0-2	8	2	7	4
1	4-6	4-6	5	2	8	3
2	10-12	5-6	5	5	5	5
2	4-6	2-3	6	5	9	4
2	7-10	3-5	7	2	6	5
2	4-6	2-3	7	3	5	5

Figure A.2: Table of quantitative values from parent survey (qualitative responses were removed from this table to make data organization easier).

Appendix B: Population Data

	A	B	C	D	E
1	**Location**	**Age group**	**TimeFrame**	**DataForma**	**Data**
2	Alabama	0 to 4	1990	Number	285723
3	Alaska	0 to 4	1990	Number	56984
4	Arizona	0 to 4	1990	Number	305827
5	Arkansas	0 to 4	1990	Number	167225
6	California	0 to 4	1990	Number	2535527
7	Colorado	0 to 4	1990	Number	261231
8	Connecticu	0 to 4	1990	Number	233688
9	Delaware	0 to 4	1990	Number	50328
10	District of C	0 to 4	1990	Number	37142
11	Florida	0 to 4	1990	Number	902347
12	United Stat	0 to 4	1990	Number	18856447
13	Georgia	0 to 4	1990	Number	509392
14	Hawaii	0 to 4	1990	Number	85123
15	Alabama	5 to 11	1990	Number	409168
16	Alaska	5 to 11	1990	Number	72223
17	Arizona	5 to 11	1990	Number	397175
18	Arkansas	5 to 11	1990	Number	245100
19	California	5 to 11	1990	Number	3101496
20	Colorado	5 to 11	1990	Number	356062
21	Connecticu	5 to 11	1990	Number	288511
22	Delaware	5 to 11	1990	Number	65534
23	District of C	5 to 11	1990	Number	41650
24	Florida	5 to 11	1990	Number	1165149
25	United Stat	5 to 11	1990	Number	25266803

Figure B.1: Screenshot of downloaded population data set.

Population Division, U.S. Census Bureau:
http://datacenter.kidscount.org/data/tables/101-child-population-by-age-group?loc=1&loct=1#detailed/1/any/false/870,573,869,36,868/62,63,64,6,4693/419,420

Appendix C: Other Sources

Florida State Univ., Tallahassee. Center for Music Research. “The Role of the Fine and Performing Arts in High School Dropout Prevention.” ERIC - Education Resources Information Center, Center for Music Research, 217 HMU, Florida State University, Tallahassee, FL 32306 (Free)., 30 June 1990.

Jay P. Greene, Brian Kisida, Cari A. Bogulski, Anne Kraybill, Collin Hitt, & Daniel H. Bowen. “Arts Education Matters: We Know, We Measured It.” Education Week, Editorial Projects in Education, 2 Dec. 2014.

Randi Korn & Associates, Inc. “Solomon R. Guggenheim Museum Teaching Literacy Through Art .” Museum Visitor Studies, Evaluation & Audience Research , Apr. 2007.