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Project 3
Kusudama Experiment
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I wanted to create a visualization that would depict systems complexity. I took the idea of a Japanese Kusudama, which is a modular origami sculpture, literally meaning “medicine ball” and pieced together geometric pieces to form a geodesic structure.

I printed old world maps on one side of the paper and kept some of the original patterns of origami paper to create a juxtaposition that was both aesthetic, but also that would show that within a system, there are other patterns and designs, often derived from society and culture (in this case, referring to my own Japanese culture) that play a role in systems complexity. I used geometric shapes to piece the entire sphere together and rearranged the patterns in a way that I felt was rhythmic and culturally unique.

I felt it was important to experiment with ways in which to visualize complex systems. I had originally tried to design paper that was completely covered in map graphics, but realized after the start of construction that 1) it was too literal and 2) it lacked a more personal interpretation of a systems model. This is why I chose to print on patterned origami paper.

While constructing this Kusudama, I realized how each piece was necessary to completing the entire sphere. Without one piece in its proper place, the sphere would not hold together as a whole. The emergence of holism was both quick and profound. The naturally developed realization served as an indication that holistic structures are integral in systems thinking, as well as important in maintaining the spine of sustainability processes.

Each piece of the Kusudama needed to be folded as precisely as possible. If one piece was folded wrong, the entire sphere’s alignment would shift, or other parts would not fit in properly. I had to be very careful while folding the creases in each paper.



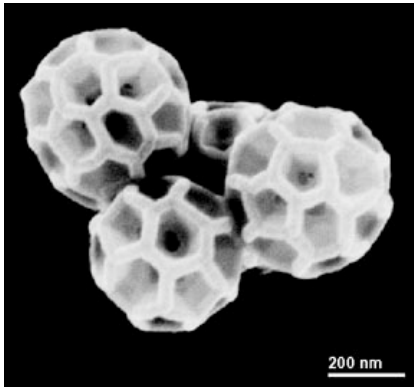
The experience of having to construct the Kusudama allowed to me to realize how systems are not only complex, but also precise and often greatly reliant on other systems to maintain themselves. It's crucial that each component of a systems structure maintain it's own precision so it can exist alone or be accessible to exist in tandem with other systems.



Even the inside of the Kusudama was complex. The above image is of the underside of the structure. It is just as complex as the exterior. Once you complete the Kusudama, you can't see if anymore because it's enclosed inside the sphere. This brings up the point that even the simplest systems in nature can have a complex underlying structure beneath them. There are many systems we can visibly capture or witness in life, but within those systems are also complex and beautiful structures that serve as vertebrates or inner workings of exterior layers.



The idea of a geodesic sphere is nothing new. We can see geodesic designs in both architecture and in the biological world. American architect, R. Buckminster Fuller designed the first geodesic dome in the 1950's. His initial purpose for these domes was to design affordable housing that could be efficiently mass-produced. In the 1960's and 1970's, geodesic domes became popular among environmentally conscious people who were looking to self-build affordable homes.



On a biological level, molecules are shaped in the same way to create basic elemental structures that we rely on for our very existence. When constructing the Kusudama, I did not initially consider how the form was reflected in other realms of design and biology. While viewing the finished piece, it dawned on me how such a structure exists everywhere. It holds up our roofs and it brings structure to our bodies. Even the earth itself is a sphere, which by the force of gravity, holds itself together, and by the interweaving of various systems continues to exist.

This experiment was important because it contextualized the whole and the sum of a system's parts. On a design level, there's room now for more experimentation with graphics, typography and technology (i.e. turning the sphere into a hanging lamp or glowing indicator of room toxicity levels). There's also an opportunity to play with scale, materials and placement. What if these Kusudama were made of recycled papers? What if one was constructed to be human-sized? What if this structure was placed in a public space? How can something like this serve a communicative purpose that could perhaps instigate and inspire new ideas and initiatives around systems thinking?

It was interesting to experience how this one exercise created an opportunity to look into other relative forms that served a similar purpose to the Kusudama experiment. Perhaps that's what makes networks "beautiful" because they emerge sometimes when you least expect them to, and what more, these networks all serve a greater purpose.

Source information:

<http://www.madehow.com/Volume-6/Geodesic-Dome.html>