CCA, IxD, MDes, Systems, 2017, Fall
Syllabus
http://www.dubberly.com/courses/systems_2017_fall/

Weekly Schedule

0	T	09/05	Introduction
1	T	09/12	Visual Systems
2	T	09/19	Counting Systems
3	T	09/26	Communications Systems
4	T	10/03	Application Data Model
5	T	10/10	Grid Systems + CMS
6	T	10/17	Information Structures
7	T	10/24	Information Structures: Interactive Models
8	T	10/31	Dynamic Systems: Modeling Stocks and Flows
9	T	11/07	Automatic Control Systems: Modeling Feedback
10	T	11/14	User Conceptual Models: Home Thermostat
11	T	11/21	Final Project: Product Service Ecology, Current State Model
12	T	11/28	Final Project: Proposed Future State Model
13	T	12/05	Final Project: Prototype of Future State
14	T	12/12	Final Project: Summary Presentation (last class meeting)
15	T	12/19	Revisions + web site due (no class meeting)
	F	12/22	Grades due

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Description

This studio course introduces grad students to the basic language and frameworks of systems, in the context of interaction design. Please see the vocabulary below.

Objectives

Students will learn to
- Understand systems—recognize common system structures and use them to model a specific situation
- Represent systems—build a model of a system and use the model to inform design of interfaces, services, and platforms
- Design systems—use common system structures to identify breakdowns, diagnose problems, and generate improvements

Requirements

Attendance is required for all class meetings. Tardiness will affect final grades. You must construct a web site for your work, and you must post your assignments before each class.

Grading

Weekly assignments will be graded plus/check/minus.
Weekly assignments receiving a minus must be revised.
The overall course grade will be calculated as follows:
- In-class participation counts for 20%.
- Weekly assignments count for a total of 20%; final web site with all assignments counts for 20%.
- Preparatory sketches for final project counts for 20%; final project counts for 20%.

In-class participation is affected by contributing to discussion and critiques; missed readings and lack of preparation will also be noted. Participation will be summed and can shift the overall grade by one letter. No incomplete will be given except in extenuating and unforeseen circumstances, and you must have already completed a substantial portion of the course, with passing grades. Grade scale:
A = Outstanding achievement, A– = Less so
B = Good achievement, B+ = More so, B– = Less so
C = Satisfactory achievement, C+ = A little better, C– = A little worse
D = Poor achievement, D+ = Less so, D– = More so
F = Failure to meet course requirements

Required Readings

On Modeling

- Excerpts from Novak & Gowin, *Learning How to Learn*
http://www.dubberly.com/courses/design_theory_2016/01._a_Learning_How_To_Learn.pdf

- Dubberly, H., "Creating Concept Maps"
http://www.dubberly.com/courses/design_theory_2016/01._b_Creating_Concept_Maps.pdf

- Dubberly, H., "Models of Models"
http://www.dubberly.com/courses/design_theory_2016/01._c_Models_of_Models.pdf

On Systems Theory

- Boulding, K., "General Systems Theory—The Skeleton of Science"
https://www.panarchy.org/boulding/systems.1956.html

- Joi Ito, "Design and Science," http://www.pubpub.org/pub/designandscience

- Michael Porter, "How Smart, Connected Products Are Transforming Competition,"
https://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition

- Capra, F., and Luisi, P. L., *The Systems View of Life: A Unifying Vision,* Cambridge University Press, Cambridge, 2014.

- Meadows, D., *Thinking in Systems,* Chelsea Green, 2008.
Chapter 1: The Basics

- Shannon, C., "A Theory of Communications," 1964, pages 31-35.
http://www.dubberly.com/courses/design_theory_2016/03._a_Shannon.pdf

- Ashby, W. R., *An Introduction to Cybernetics,* Chapman and Hall, 1957.
Chapter 1: What Is New, and Chapter 11: Requisite Variety.
http://pespmc1.vub.ac.be/books/introcyb.pdf

- Glanville, R., "Second-order Cybernetics,"
http://www.facstaff.bucknell.edu/jvt002/brainmind/Readings/SecondOrderCybernetics.pdf

- Pask, G., "The Architectural Relevance of Cybernetics," 1969.
http://www.dubberly.com/courses/design_theory_2017/10._a_Pask_Cybernetics.pdf

Suggested Additional Readings

On Systems and Design

- Gerstner, K., *Designing Programmes,* Hastings House, New York, 1964.

- Rittel, H., "On the Planning Crisis: Systems Analysis of the First and Second Generations," 1972. http://www.dubberly.com/courses/design_theory_2016/08._b_Rittel:_On_the_Planning_Crisis.pdf

- Haque, U., "On the Architectural Relevance of Gordon Pask," 2007. http://isites.harvard.edu/fs/docs/icb.topic983682.files/Week%2005/W05-2%20Usman%20Haque-%20The%20Architectural%20Relevance%20of%20Gordon%20Pask-.pdf

- Dubberly, Haque, & Pangaro, "What is Interaction?" 2009. http://www.dubberly.com/wp-content/uploads/2009/01/ddo_article_whatisinteraction.pdf

- Dubberly & Pangaro, "What is Conversation?" 2011 http://www.dubberly.com/wp-content/uploads/2009/07/ddo_article_whatisconversation.pdf

On Systems and Ethics

- Buchanan, R., "Design Ethics," 2005. http://www.dubberly.com/courses/design_theory_2016/03._b_Buchanan,%20Design%20Ethics.pdf

- von Foerster, H., "Ethics and Second-order Cybernetics," Stanford Humanities Review, Volume 4, Issue 2, 1995. http://dl.acm.org/citation.cfm?id=212248

- Maturana, H., "Meta-design," 1997. http://www.inteco.cl/articulos/006/texto_ing.htm

On the History of Systems Thinking

- Dubberly, H., "How cybernetics connects computing, counterculture, and design," 2015. http://www.dubberly.com/wp-content/uploads/2015/10/Cybernetics_and_Counterculture.pdf

Primary Systems Models and Related Terms
What you should learn in this course.

Levels of Systems,
- static *frameworks*, simple dynamic *clockworks*, control *thermostats*, self-maintaining *cells*, simple societies *plants*, self-aware *animals*, conscious *humans*, organizations *living in language*, transcendent (Kenneth Boulding)
- static rules, dynamic, feedback, self-organizing, learning, conversation

Combinations and Permutations
- theme and variations; also state diagram, phase space
- counting in base 2, 3, and 16 (hex)
- cellular automata, recursion, fractals

Basic Information Structures + Criteria
- name-value pair, array, matrix, tree, web (graph)
- principle of least means (Ockham's razor); principle of consistency (form + content)
- necessary and sufficient
- MECE (mutually exclusive, collectively exhaustive)
- CIPU (clear if previously understood)

Systems Dynamics, from Donella Meadows
- dynamic equilibrium—stocks, flows, lag, source, sink
- process, transform functions—proportional, inverse, S-curve, hockey stick, long tail
- resource cycles, tragedy of the commons, leverage points
- open loop, closed loop

Communications, from Shannon
- sender, code, message, channel, noise, receiver

Control Mechanisms
- system, environment, boundary, homeostasis
- feedback loop—goal (set-point, threshold), action, measure
- mechanism—sensor, comparator, actuator (effector)
- essential variable, range, resolution, frequency,
- virtuous and vicious cycles
- explosion, collapse
- negative feedback, positive feedback
- reinforcing, dampening, balancing
- current state, desired state
- error, detection, correction
- circular processes, circular causality

User Conceptual Model, from Jeff Johnson & Austin Henderson
- object, link, action, attribute

Bootstrapping, from Douglas Engelbart
- basic process, improving the process, improving improving

Platform, API, modularity, smart-connected product, product-service ecology

More Advanced Systems Models

Requisite Variety
- stability, invariant organization
- disturbances, responses

Second-order Systems
- goal-means trees
- observer, observed, controller, controlled

Co-evolution
- population, trait, variation, selection
- cost, advantage
- cooperation and competition as evolutionary mechanisms
- drift

Models of Learning, e.g., Nonaka

Models of Conversation, from Pask
constructivism
agreement, (mis-)understanding
"an agreement over an understanding"
bio-cost, bio-gain

Other Systems Thinking Vocabulary Terms

servo-mechanism, governor, hunting, oscillation, prediction
control, communication, structure, organization,
teleology, purpose, goal-directed, self-regulating, co-ordination, regulation

emergence, feed-forward, back-talk
first order, second order

dissipative systems, self-sustaining
autopoiesis, allopoetic systems
- structural coupling
  (Behavior is structurally determined—history, individualism, learning.)
- "consensual co-ordination of consensual co-ordination"
- "conservation of a manner of living"

black box
explanatory principle "organizational closure" self-reference, reflexive

ethical imperative, "generosity in design", "aesthetiquette"

CCA, MDes IxD, Systems, 2017, Fall
Assignment 1 — Due: Tuesday, September 12,
Visual Systems

Readings:
Dubberly, H., "Models of Models"
http://www.dubberly.com/courses/design_theory_2016/01._c_Models_of_Models.pdf

Boulding, K., "General Systems Theory—The Skeleton of Science"
https://www.panarchy.org/boulding/systems.1956.html

Create a diagram outlining Boulding's framework; add your own examples.
Consider what other ways we might frame systems.

Exercise:
Extend an existing visual system.
Design six new numerals as an addition to an existing typeface.

Begin by considering the Hindu-Arabic numerals, 0 to 9, and their structure.
What makes them a coherent set, a family of related elements, a "visual system"?

Pick a typeface; list each of the numerals at 72 points.
Deconstruct the numerals into constituent parts — modules that are reused.
List the modules, and then show how they are used to construct each of the numerals.
Consider the rules governing numerals in your typeface; write a summary of the rules.

Next, following your rules, recombine your modules to create six new numerals,
for a total of sixteen numerals, all forming a coherent visual system.
None of the numerals should "pop-out" of the set.

For extra credit, consider your numeral set in terms of structure and style.
Maintaining the same structure, create a second version of the set in another style.
Hint: Consider the structure and style differences between Helvetica + Bodoni.

Pay attention to craft; design your final page so that it is clear and well organized.

Format for reading summary + exercises: 11 x 17 inch sheet; landscape (horizontal)
Be sure to add a title, your name, and the date to both sheets.
Save as a PDF, upload to your web site, and bring a print of both sheets to class.

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CCA, IxD, Systems, 2017, Fall
Assignment 2 — Due: Tuesday, September 19
Counting Systems

Readings:
Novak & Gowin, *Learning How to Learn,* selected excerpts
http://www.dubberly.com/courses/design_theory_2016/01._a_Learning_How_To_Learn.pdf

Bonsiepe, G., "Interface An Approach To Design", selected excerpts
http://www.dubberly.com/courses/systems_2017_fall/05._Bonsiepe.pdf
Create sketch notes or a concept map of Bonsiepe's key ideas and models.

Exercise:
Animate every combination of segments in a 7-segment LCD digital numeric display.
Each segment can be on (1) or off (0), creating 128 possible combinations of off + on.
Each combination is represented by a base 2 number, i.e., 000 0000 to 111 1111.
List the numbers 0 to 127 (in base 2) to create a "display list" to drive the animation.

Then create a second animation displaying the segmented numerals from 0 to 9.
For this, you will need to create a second display list (with only 10 lines).

In Adobe Illustrator or a similar app, draw a 7-segment grid for your numerals.
Each segment should be a filled polygon shape (not a line and not a rectangle).
Use the art board tool to shrink the art board to fit snugly around your configuration.
Save your file in SVG format.

Download http://www.dubberly.com/courses/systems_2017_fall/Hexagon.zip
It includes 3 files: index.html, main.js, and main.css — you will edit these.
First, open a modern browser; drag index.html into the window to play the animation.

Set-up a text editor, such as Text Wrangler. (Text Edit and MS Word won't work.)
In a text editor, open your SVG file; copy the "polygon" information.
Open the index.html file; delete the lines that begin with "polygon".
In the same place, paste in your seven lines of new polygon data.
Likewise update the "viewbox" data in index.html with your new data.
Save your file. Drag the index file into your window; your animation should run.
If the polygons display out of order, re-arrange them in the index.html file.

Re-order your display list to create a second animation.
In a text editor, open the main.css file, find a string of binary numbers from 0 to 63.
Edit that list to create a new sequence; save your file; and play it.
Put both animations on your web site; if necessary, link to a new page.

Diagram how your second animation "works". How are the "data" stored?
What does the "user" see? What transformations link the two?

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CCA, IxD, Systems, 2017, Fall
Assignment 3 — Due: Tuesday, September 26
Communications Systems

Reading
Shannon and Weaver, "A Mathematical Theory of Communication."
http://www.dubberly.com/courses/design_theory_2016/03._a_Shannon.pdf

Create sketch notes or a concept map of the key ideas and models.

Exercise
Design + build a device, capable of sending and receiving messages at a distance.
(For the purpose of the class, the distance will be 10 feet.)

Design a new code that can transmit any English text message.
(You cannot use existing codes, such as Morse.)

Find a partner from the class; together create your device + code.

Document your code on an 11 x 17 sheet of paper (horizontal format).
This will be your code table.

With your partner, practice sending and receiving messages using your code.
We will run a "test" during class; test messages will be about 20 characters.

Consider ways to ensure messages are accurately received.

How could a message be made more "secure"?

Create a diagram of how message transmission by telegraph works.
Consider the actors, objects, processes, and transformations.
Map the "layers" or "stack" required in a transmission.

Format: 11 x 17 inches; landscape (horizontal format).
Be sure to add a title and your name to both sheets.
Bring prints to class and post to your web site.

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CCA, IxD, Systems, 2017, Fall
Assignment 4 — Due: Tuesday, October 3
Application Data Model

Reading:
Vannevar Bush, "As We May Think," *Atlantic Monthly,* July, 1945.
https://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Create a diagram explaining how a desktop application "works":
- How are the "data" stored? What is the "shape" of the data?
- What intermediary forms does the data take (if any)?
- What does the "user" see?
- What transformations link the stored data to what the user sees?

Choose any application that is focused on one data type, such as word processor, spreadsheet, paint program, object-oriented drawing program, sound editing app.

Imagine your audience is a bright fifth grader (a ten year old).

Create an example data set (or file); keep it as simple as possible;
include enough detail to convey the basic function of the app.
In addition, describe what an empty data set looks like.

Create a representation of your example data set at each "levels" of the system.
Show at least three levels and how they map to each other.
- Data as displayed
- Conceptual or high-level data format behind what the user sees
- Any intermediate levels, such as hex
- Binary

Describe and show how data is created (input), selected, and updated (changed).
What key tools are involved?

Include your name, a title, captions, and brief explanations as needed.
Consider content, writing, and typography.
Format: 11 x 17 inches; landscape (horizontal format).

Bring a print to class and post to your web site.

###

CCA, MDes IxD, Systems, 2017, Fall
Assignment 5 — Due: Tuesday, October 10
Grid Systems + CMS

Reading:
Licklider & Taylor (1968), "The Computer as a Communications Device."
http://worrydream.com/refs/Licklider%2%20The%20Computer%20as%20Communication%20Device.pdf Create sketch notes or a concept map of the key ideas and models.

Exercise for those in group 1
Deconstruct Massimo Vignelli's design for the original Audubon Field Guides.
Make a diagram or "map" representing "the system" behind the guides.

Begin by cataloging all the page types:
- How many basic types are there?
- What's the "grid"?
- What information appears on each page type? (What are the content "widgets"?)
- How is each content widget constrained? (e.g., maximum size or length)
- What elements are reused?

Then catalog the content:
- How many "items" are included? (under each template)
- How are they classified? (what is the information structure?)
- How could the content be represented as a database?

Finally, create a diagram or map explaining Vignelli's design system.

Exercise for those in group 2
Download the free Audubon Bird Guide App, http://www.audubon.org/apps
Map it. Begin by exploring the menus and where they jump to the website.
We will only map the app, not the site, simply noting the connection.

Capture the navigation + settings screens and one example of each template screen.
(We don't need to include every photo of a bird, one example species will suffice.)

Create a map, beginning with the home screen; link to connected screens and then to screens connected to them, and so on, so that the entire app is covered in the map.

The goal is to show all the screen types on one surface and how users navigate.
Your map will likely be fairly large, e.g., 36 x 72 inches or longer.

Bring printed versions of your maps to class and post, too.
Consider using a roll-fed plotter to print.

###

CCA, IxD, Systems, 2017, Fall
Assignment 6 — Due: Tuesday, October 17
Information Structures

Reading:
Kay, Alan (1972), "A Personal Computer for Children of All Ages."
https://mprove.de/diplom/gui/Kay72a.pdf
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Represent your family tree—as a table, a sequence (time line), and a tree,
(Mapping human networks is a way to understand information structures.)

Create three information maps:

Table or matrix, e.g., name-value pairs
Create a list—a table with each person in your family history listed as a row.
Go back to your great grandparents. (You may use any family tree.)
Include columns for last name, first name, date of birth, death, location of main residence, pointer to a portrait. Include another column listing connections.

Sequence or array, e.g., a slideshow or timeline
Create a timeline including all the members of your family tree.
Include names *and indicate the range* of time during which they lived.

Tree or hierarchy, e.g., root-node-leaf or parent-child-sibling
Create a diagram of your family tree, going back to your great grandparents.
Include names, portraits, and dates of birth/death.

Format: 11 x 17 inches; landscape (horizontal format) for each map.

Be sure to add a title and your name to each sheet.
Bring prints to class and post to your web site.

###

CCA, IxD, Systems, 2017, Fall
Assignment 7 — Due: Tuesday, October 24
Information Structures: Interactive Models

Reading:
Meadows, D., *Thinking in Systems,* Chapter 1: The Basics
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Create an interactive information structure, based on your three maps.

Make interactive versions of your list, timeline, and family tree.
Each person is a "node;" each "node" will be a "slide" or "card" or "page,"
and each link will be a "hyperlink."

Family List
Create an index or directory slide listing everyone alphabetically.
(Extra credit for enabling alternate orderings of the list, e.g., sorting by birthday.)
Link to a "Rolodex" with a slide for yourself and each family member.

Family Timeline
Create a slide sequence of births and deaths starting from today, going backwards.
Users should also be able to navigate forwards in time.

Family Tree
Start with yourself (your slide); link to each of your parents; link to their parents; and so forth. Links should be "bi-directional," e.g., users need a way to get back to you from your parents. Your system should be extensible for many more generations.
You may want to consider marriages as nodes (single slides or pages etc.).

Include a title slide with your name and a TOC.
Use transitions (animations) between slides to enhance navigation.
Keep your typography and layout simple.
Illustrations are fine in lieu of photos; however, this is not an illustration assignment.

(Extra credit for integrating the structures more deeply;
for example, can you have just one "slide" per person? (instead of three)
Or can you drive the whole system out of a database?)

Format: You may use Keynote, PowerPoint, Prezi, InVision, or similar apps,
or you may code in HTML/CSS/JS.
Post your file or a link to it on your web site.

###

CCA, IxD, Systems, 2017, Fall
Assignment 8 — Due: Tuesday, October 31
Dynamic Systems: Modeling Stocks and Flows

Reading:
Pask, Gordon (1969) "The Architectural Relevance of Cybernetics"
http://www.dubberly.com/courses/design_theory_2017/10._a_Pask_Cybernetics.pdf
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Create a diagram depicting a person in terms of at least six stocks.
Consider yourself in terms of stocks and flows, sources and sinks, and lag.

At least one stock should come from each of these categories:
physical, emotional, social and economic.

For each stock, indicate its immediate source and sink, average volume, likely range of volume, danger zones (if any) and likely flow rate.

For at least two stocks, indicate at least three prior steps in the source chain and at least three subsequent steps in the sink chain.
Do the source and sink chains ever meet?
How do the stocks affect one another?

(For extra credit, make an interactive model of one or more stocks and flows.)

Format: 11 x 17 inches; landscape (horizontal format).

Be sure to add a title and your name.
Bring prints to class and post to your web site.

###

CCA, IxD, Systems, 2017, Fall
Assignment 9 — Due: Tuesday, November 7
Automatic Control Systems: Modeling Feedback

Reading:
Morozov, Evgeny (2014), "The Planning Machine: Project Cybersyn… Big Data…"
https://www.newyorker.com/magazine/2014/10/13/planning-machine
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Identify a system that includes automatic feedback.
- The system should automatically close the feedback loop (without human input).
- Do not use a thermostat as your example.

Create a realistic illustration of the system and its operation, e.g, a photo.
- Identify the specific components of the system (the mechanism) and their functions (e.g., lever, height indicator).
- Label the components in cybernetic terms (e.g., significant variable, goal, sensor, comparator, actuator, disturbances).

Create a diagram of the system, "abstracted" in terms of feedback.
- Include all the components of the feedback loop (e.g., significant variable, goal, sensor, comparator, actuator, disturbances).
- Represent the relationships between components visually.
- Label each cybernetic component and note the corresponding physical part.

Your diagram should help the audience answer these questions:
- What are the relevant components of the system?
- How is information transmitted between components? In what form?
- What is the goal (desired state) of the system? How is the goal set?
- What forces typically disturb the system or push it away from its goal?
- What does the system measure (to create feedback)? How?
- What part of the system matches feedback (current state) to goal (desired state)?
- How does the system respond to disturbances?

Format: 11 x 17 inches; landscape (horizontal format).
The illustration and diagram should be on the same page.
Post to your web site.

###

CCA, IxD, Systems, 2017, Fall
Assignment 10 — Due: Tuesday, November 14
User Conceptual Models: Home Thermostat

Reading:
"Conceptual Models in a Nutshell." http://rivcons.com/wp-content/uploads/2015/07/Conceptual-Models-in-a-Nutshell-«-Boxes-and-Arrows.pdf

"Conceptual Models: Core to Good Design"
https://www.youtube.com/watch?v=i_DWYYZD31w&noredirect=1

Kempton, Willett (1986) "Two Theories of Home Heat Control"
http://www.dubberly.com/courses/systems_2017_fall/10._Kempton.pdf
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Design a new user interface for thermostat; create 3 UI options.

To begin, create a diagram of a home HVAC system
- What are the physical components of the system? (artifacts, stocks, + flows)
- What are the information elements of the system? (information + feedback)

Create a "user conceptual model" of a thermostat that controls the system.
- What does the user need to know in order to successfully use the system?
- What "tasks" do users undertake when using it?
- What (data) "objects" do users encounter?
- What "actions" can users take on the objects?
- What "properties" do the objects have?
- What are the "relations" between the objects?

Write out a list of user tasks and create a table of objects, actions, and properties.
Your model should NOT include presentation issues or implementation issues.

Create 3 thermostat UI options (sets of displays and controls).
The physical form factor is up to you (e.g., 1.94 x 2.91 inches, touch screen is OK).
The 3 UI options should be as different as you can make them.

Your UI should map directly to your "user conceptual model".
Once you start designing your UI, you may find that you need to modify your model.

Create a mock-up of the displays and controls (what users see + change).
Specify how users will interact with the thermostat.

Format: printed page, 11 x 17 inches; landscape (horizontal format).
Bring printouts and post to your web site.

###

CCA, IxD, Systems, 2017, Fall
Final Project — Due: Part 1, 11/21; Part 2, 11/28; Part 3, 12/5; Part 4, 12/12
Product-Service Ecology — Wellness

Reading:
Michael Porter, "How Smart, Connected Products Are Transforming Competition,"
https://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition
Create sketch notes or a concept map of the key ideas and models.

Exercise:
Find someone, who has a chronic health condition, with whom you can talk;
e.g., arthritis, asthma, CAD, CHF, Chrons's, COPD, diabetes, HIV, hypertension, etc.

Imagine sensors that monitor body chemistry painlessly and connect to "the cloud".
Imagine other cloud-connected devices that deliver therapies.
How could such technology be integrated into people's lives to help them *and* their caregivers better manage chronic conditions? Design an integrated "ecology".

Part 1 — Model the current state — due 11/21
Create a model of the condition and care — in terms of maintaining homeostasis.
What does the person measure? e.g., blood glucose, blood pressure, weight, etc.
How do they "manage" that variable? (lower or raise it?) What is the feedback loop?
Create a model of the person's care-giving network. Who supports them? When? How? Include family, friends, paid services, healthcare professionals, etc.
Create a journey map showing how the person manages the condition during a week.
Include doses and timing of medications, food, exercise, interactions with caregivers.

Part 2 — Model the future state — due 11/28
Propose a system to help the person *and* caregivers better manage their wellbeing.
What elements are needed? How do they work together? How are they controlled?
How do components, services, and people connect? Outline key user tasks,
create a user conceptual model of the system, and wireframes for control screens.

Part 3 — Prototype the future state — due 12/5
Create detailed mock-ups of key screens in the primary user task.
Annotate your mock-ups to show how the user interacts with the controls.
Create a draft presentation introducing the problem, "ecology", and controls.

Part 4 — Create a presentation — due 12/12 (posted on web site)
Refine your work from parts 1, 2, and 3 and create a complete presentation.
Be sure to include a cover, introduction, process, solution, and your name.

Format: 11 x 17 inches; landscape (horizontal format).
Bring prints to class for parts 1, 2, and 3; and post all on your web site.

###

Readings for remaining classes

11/28
Yegge, Steven (2011), “Yegge's Rant.” (On the need for platforms at Google)
https://plus.google.com/+RipRowan/posts/eVeouesvaVX

12/05
Lanchester, John (2017), “You are the product” (understanding Facebook)
https://www.lrb.co.uk/v39/n16/john-lanchester/you-are-the-product

12/12
Friedman, Ken (2012) “Models of Design: Envisioning a Future Design Education”
https://s3-us-west-2.amazonaws.com/visiblelanguage/pdf/V46N1N2_2012_E.pdf

###

Reading schedule

09/12 Boulding

09/19 Bonsiepe

09/26 Shannon

10/03 Bush

10/10 Licklider & Taylor

10/17 Kay

10/24 Meadows

10/31 Pask

11/07 Morozov (Cybersyn)

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