



PROJECT #1: PRODUCT REDESIGN



Introduction: The main objective of this project is to redesign a product that you use (or someone you know well uses) every day. You will work through the early stages of the design process, moving from a simple patent analysis to user analysis to conceptual prototyping to basic user testing. The idea is to “get your hands dirty” while we study the design process itself – and to have a bit of fun along the way.

References: In addition to your texts, we will be using the *d.School Bootcamp Bootleg* (published on-line by the Hasso Plattner Institute of Design at Stanford University) for inspiration and guidance. A PDF version of this document has been uploaded to the Project folder in CANVAS (under Week 2- Project #1).

Documentation: You will be submitting a **written report** for this project, which should contain documentation on everything you do. (When in doubt: *write it down* while it’s happening and *write it up* to hand in!) You may choose the specific format for this report, as long as you provide the requested information for each task in a neat and complete fashion at a level appropriate for graduate studies. In addition, writing quality (grammar, spelling, how you express yourself) does count (15-20%).

Task 1: Patent Number Search (due 10/29)

1. Identify one example in each of the following categories of a patented product¹ that is currently (or recently) used by you, a close family member, and/or a close acquaintance at work².
 - An electronic device
 - A food preparation device
 - A toy or game (non-electronic)
 - A mechanical tool
 - *Wild Card* item (anything non-electronic)
2. For each category/example, please hand in the following information:
 - The name and brand of the item (i.e., what it is and who makes it)
 - The U.S. patent number(s) found on the item
 - A list of people you know who currently use this item (may include yourself)
 - Optional (but nice): a photo or sketch of the item

Task 2: Choosing Your Target Product + Patent Analysis (due 10/29)

1. From the patented items you identified in **Task 1**, choose one product you have some passion around redesigning (whether it is for your use or for someone you know). If none of the items on your list fit this condition, find one that does and re-do Task 1 for that product.

¹ In each case, a U.S. patent must already be awarded – i.e., “patent pending” items are not acceptable.

² I am setting this condition so the items are already available to you, without the need to purchase them.

2. Locate and print a copy of the U.S. patent for your chosen product/invention; you should include this patent in your final project report. Print the associated drawings if possible; otherwise, print the full-text version.
3. From the patent document and other relevant sources (as needed), identify and report the following information about your chosen product/invention:
 - a. The number and name of the invention (i.e., title of the patent)
 - b. The inventor(s)
 - c. The assignee(s)
 - d. The date the patent application was filed
 - e. The date the patent was granted
 - f. The year in which the patent will expire
 - g. The current U.S. class(es) and subclass(es) for this invention (both names and numbers; also indicate the major U.S. class and subclass from among these)
 - h. The U.S. class(es) and subclass(es) that comprised the Field of Search for this invention (again, both names and numbers)
4. From the description and claims of this invention, describe its *novelty* and *utility*. That is, what advantages and unique features does it claim to have when compared to the prior art? What is the intended use of this invention?
5. Locate at least **2 patents** cited as *prior art* for your chosen product (Note: you do *not* need to include these patents in your project report). Identify the U.S. Patent number, title, issue date, and inventor's name(s) for each of these patents. Discuss the relationships between these cited inventions and the device you are redesigning – for example: What do they have in common? How are they different? Why do you think they were considered relevant to your device?

Task 3: User-Centered Needs Analysis (due 11/7)

1. Begin this task by reading through the *d.School Bootcamp Bootleg* document (if you haven't already).
2. Focusing on the **Empathize mode** of the d.School's human-centered design process (see pp. 9-20, *Bootcamp Bootleg*), interview *at least 2* current users of your chosen product (people other than yourself), incorporating the following steps/elements:
 - a. Prepare interview questions as described on p. 12 of *Bootcamp Bootleg*. Record the “core” questions you will use as the backbone of your user interviews, remembering that you will almost certainly revise and add more questions as you go.
 - b. Use the interview guidelines on p. 13 of *Bootcamp Bootleg* (“Interview for Empathy”) during your interviews. If possible, use a partner or recording device (audio or video) to record each interview. If these options aren't available, then record the responses of your interviewees as meticulously as possible yourself, remembering to observe and note down their behaviors and emotional reactions as well as what they say.
 - c. Document and synthesize your interview results with an **Empathy Map** (p. 18, *Bootcamp Bootleg*) for each user. These don't have to be fancy, but do make them BIG (e.g., use flipchart or butcher-block paper, Post-It notes, and markers) and do a thorough job. Make sure your maps are neat and legible, so your classmates can read them.

3. Focusing on the **Define mode** of the d.School design process (*Bootcamp Bootleg*, pp. 21-29), generate **problem statements** that will guide your prototyping efforts in **Task 4**. In particular:
 - a. Try using Powers of Ten, Why-How Laddering, and one of the Point-of-View methods (see *Bootcamp Bootleg*, pp. 21-27) to come up with different ways of looking at user needs.
 - b. Discuss your “first cut” problem statements with a classmate to get more suggestions.
 - c. In the end, you need to generate (and record) *at least 10* “**How might we ...?**” statements that you will use to drive prototyping and testing in the next task.

Task 4: Prototyping, Testing, and User Feedback (due 11/7)

1. Based on your patent analysis, user interviews, and problem statements – and focusing on the **Prototype mode** of the d.School’s design process (see especially pp. 36-42, *Bootleg Bootcamp*) – build *at least 3 basic (conceptual) prototypes* for a redesigned version of your chosen product.
 - a. You may use sketches to supplement your designs, but I want physical prototypes as well. These prototypes can be built using very basic materials (e.g., cardboard, paper, tape, found objects) – no purchase necessary – and they needn’t actually “work”. Focus on relaying the intended functionality of your design to the user in a conceptual sense.
 - b. Document your prototyping process (what you did, why you did it, what you were thinking, etc.). Use the principles described in **Prototype for Empathy, Prototype to Test, Prototype to Decide, Identify a Variable, and User-Driven Prototyping**.
2. Focusing on the **Test mode** of the d.School’s design process, show your prototypes to *at least one* of the users you interviewed in **Task 3** and elicit their feedback to your redesigns.
 - a. Use a **Feedback Capture Grid** (*Bootcamp Bootleg*, p. 43) to record their feedback to your prototypes. Again, make these grids BIG and readily presentable in class; flipchart paper, Post-Its, and markers are good tools to use.

Task 5: Prototype Presentations and Project Report (due 11/7)

1. **Prototype Presentations:** Bring your **prototypes** to class. Be prepared to demonstrate their features, basic functionality, unique advantages, etc. – but no slide presentations! In presenting your prototypes to the class, I will ask you to discuss your *choice of product* for redesign, your *user’s needs*, your *problem statements*, your *prototyping and testing process*, and your *user’s feedback*. This will be a group discussion, so be prepared to field questions from your classmates (and to ask them questions when it’s their turn!).
2. **Project Report:** As noted earlier, the **format** for this report is really up to you, as long as it covers all the tasks, provides documentation for your efforts, and includes the specific deliverables required. It must also be neat, grammatically correct, and well-written at a graduate level. There is no minimum or maximum length for the report; be as thorough as necessary and as concise as possible!

In addition to the documentation requested in these pages, please include **your reflections** on the following questions to close out your report:

- a. Which part of this redesign process did you enjoy most? Which was most challenging? Why?
- b. What do you think of yourself as a designer?