

## Before You Make a Thing

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This resource is a guide for Technology and Society 200 (Fall 2018; 60 undergraduate students), "Prototyping Pasts and Futures," at the University of Victoria. It consists of three point-form lists. The first is a series of theories and concepts drawn from assigned readings, the second is a rundown of practices corresponding with projects we studied, and the third itemizes prototyping techniques conducted in the course. All are intended to distill material from the term and communicate its relevance to project design and development. Although it's written for a specific course, I hope it's useful in other contexts.

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### Theories and Concepts

- Approach technologies as congealed labour; doing so expands what "technology" means and underscores the embodied work and material histories at play from ideation and patenting to manufacturing and maintenance. Technologies are not only things; they are processes, too. (See [Mayer](#); [reading optophone](#); [Crawford and Joler](#).)
- Ask who benefits most from automation and novelty; doing so attends to how planned obsolescence and deskilling affect various groups of people. Automation may increase efficiency or productivity in some areas, but it most certainly shapes craft as well as demands for particular occupations and forms of expertise. (See [Luddites](#); [Crawford and Joler](#); [Pedercini](#).)
- Recognize when projects aestheticize the politics of their technologies; doing so addresses how values are expressed through design as well as through terms such as "user-friendly," "fast," "sleek," "convenient," and even "minimalist." Design may be politics by seemingly apolitical means. (See [Parker](#); [McPherson](#); [Crawford and Joler](#).)
- Engage directly the power of technology; doing so foregrounds how and why a given technology could oppress groups of people, or be used to resist oppression. Technology is not only an object but also a force, and it is entangled with issues of race, gender, sexuality, extraction, and ability. (See [Nakamura](#); [Nelson](#); [Case](#); [Pedercini](#).)
- Examine the "default settings" of technologies; doing so asks for whom, by whom, and under what assumptions they are designed, and who they may exclude and enable. All projects have intended audiences, even if those intentions are not always conscious or deliberate. (See [Skawennati](#); [Nelson](#); [Nakamura](#).)
- Avoid flattening society to a market or venue for products; doing so recognizes how social norms, contexts, and behaviours shape production, too. Society is a generalization and abstraction as well as a situation and practice that influences technologies. (See [Hendler](#); [McPherson](#).)
- Try to locate technologies in their supply chains; doing so addresses their dependencies and conditions of production, not to mention people's complicity with

anonymous materials. Technologies persist within and through vast and complex infrastructures, which are incredibly difficult to study. (See [Pedercini](#); [Crawford and Joler](#); [Le Guin](#).)

- Pair "media" (plural) with "the media" (singular); doing so affords an understanding of the relationships between content and a platform, messages and a network, formats and a venue, communications and an outlet, representation and a system. Media may be windows (through), portals (to), frames (around), links (between), containers (in), addresses (at), negotiations (with), agents (for), and records (of). (See [Nakamura](#); [Case](#); [Sullivan et al.](#); [Morgan-Parmett](#).)
- Note the everyday aspects of technology; doing so stresses the centrality of habits and standards to development. Consider, for instance, how QWERTY shapes your language and writing habits, or how HTTP protocols control the web. Technologies are not only whiz-bang spectacles but also humdrum routines; most of the time, they are rather boring. (See [Borges](#); [Bush](#).)
- Consider parthood alongside forms and wholes; doing so traces the components of technologies in archives and collections as well as in patents and claims. Technologies don't descend from the sky or spring from the minds of lone inventors; they are assembled and maintained. (See [Tennis for Two](#); [phonautograph](#); [Rosner et al.](#); [Parker](#).)
- Refrain from reducing technologies to only metaphors, experiences, or tech specs, or to only digital or analog processes; doing so acknowledges how talking about technology is entwined with using it, making it, and repairing it. All technical matters are also social and cultural matters. (See [McPherson](#); [Rosner et al.](#); [Nakamura](#).)
- Remember that data are produced, not given or captured; doing so emphasizes how this becomes that, or how data is structured, collected, and expressed for interpretation. (See [Greg and Nafus](#); [Crawford and Joler](#).)
- Read any list like this one with a healthy dose of skepticism. Generosity of interpretation goes a long way, but gaps make bridges possible, and bias fuels advice. What's missing from the list? How does it communicate? What motivates it? What does it assume? What does it want? How does it reflect a discipline or a moment in time?

## Practices

- Experiment across a spectrum of critical work; doing so values both distance and immersion. Try writing about technologies or composing critiques of them while also thinking with and through them. Researchers are not outside what they study, yet they should be aware of and reflect upon their influence and biases. (See [Rosner et al.](#); [Sullivan et al.](#); [Morgan-Parmett](#); [Barchas](#).)
- Ask for permission before working with or circulating materials, and give credit where credit's due; doing so privileges consent, licensing, attribution, and compensation in the research process. After all, the materials may not be yours to use or share. (See [fair dealing](#); [Nelson](#); [Skawennati](#); [Sullivan et al.](#); [Le Guin](#).)

- Conjecture with affordances; doing so demonstrates how design is relational. It happens between people, environments, and things; it's not just a quality or property of objects. (See [Parker](#); [Barchas](#); [Rosner et al.](#))
- Produce your own time and space through technologies; doing so may help you to project a world or speculate about one. Space and time are their own sort of media. They act upon us, but we can also compose with them. (See [Nelson](#); [Skawennati](#); [Morgan-Parmett](#); [Sullivan et al.](#))
- Articulate your position on openness; doing so stresses how dissemination is only one step in the production process. For example, open data is useful, but people also need to know where it came from, how it was produced and with whose consent, and how to interpret it. (See [black box](#); [Gregg and Nafus](#); [Crawford and Joler](#); [Le Guin.](#))
- Determine what your project will help people to compile or "re-member"; doing so foregrounds how technologies are agents of memory and forgetting. Through automation and design, they assemble parts, compile components, and refresh files. Or, they keep things found for you. (See [Borges](#); [Parker](#); [Bush.](#))
- Address the ghosts; doing so helps to engage (instead of avoid or discount) the unknowns of your project, including its histories and futures. Even though we may not comprehend or apprehend how they work, technologies alone do not explain the past, solve pressing issues, or fix the future. They are components of social and cultural processes. (See [Rosner et al.](#); [Sullivan et al.](#); [Le Guin.](#))
- Ask yourself where your project will be in ten, twenty, or even fifty years; doing so prompts attention to maintenance and obsolescence. If you want your project to stick around, then facilitate preservation and repair now rather than later. (See [Tennis for Two](#); [phonautograph](#); [reading optophone.](#))
- Where useful, value ephemerality and even magic as media; doing so may increase creativity and/or decrease pressure. Not all ideas, processes, and experiments need to be documented or tracked, and not everything about a project must be rationalized or demystified. (See [phonautograph](#); [Sullivan et al.](#); [Barchas](#); [Case.](#))
- Involve your audience; doing so helps to avoid reducing them to only users or consumers. It may also prompt some informative feedback and needed critique. (See [Rosner et al.](#); [Sullivan et al.](#))
- Don't reinvent the wheel, and be leery of over-investing in either novelty or failure; doing so may help to bypass the competitive tendencies and attention economics of design and development. Tweaking or customizing an existing technology may afford a lot; it may also reduce scope and feature creep. (See [Tennis for Two](#); [phonautograph](#); [Sullivan et al.](#))
- Make a useless or disinterested version of your project; doing so may underscore the creative and critical dimensions of technology and society. After all, not all technologies must increase productivity or efficiency. Consider the roles of technologies in art, theory, and storytelling. (See [Parker](#); [Case.](#))

## Prototyping Techniques

- *Paper*: Use paper to make a simple version of your project. Changes, especially structural changes, may be easier when you're working with index cards and pencils. (But sometimes software is indeed easier and/or better. Your call!)
- *Patent Search*: Search patent databases for wholes and parts corresponding with your project. Many ideas are patented but never mass-manufactured. Also consider common components of patents: title, date (applied and granted), drawing (exploded view, perspective, and section), background (history and motivation), description (what it does), claims (dependent and independent), and name(s) of who filed it.
- *2D/3D Translation*: Use paper, plasticine, sticks, cardboard, or software to reconstruct a 2D drawing in 3D. Or use pen, paper, or software to represent a 3D object in 2D. The translation process should give you a sense of how perspective is biased (or limited) as well as how to relate with a given object in time and space.
- *Wireframing*: Sketch your project's form and interface without focusing much, if at all, on content. Wireframes provide a good sense of how people may interact with your project, and they don't require any programming. They are also opportunities to talk about scope and feature creep (before the project is too far along).
- *Exploded-View Drawing*: Express your project as a constellation of parts and relations. Exploded-view drawings have been used for centuries to demonstrate how things come together.
- *Emulation/Migration/Collection*: Prototype how your project would be imitated or reproduced with software (emulation), how it would be treated as data or a repository of files (migration), and how it would be preserved as a system of hardware, software, wires, and whatnot (collection). These prototypes may provide a sense of your project's near future.
- *Old/New Media*: Make old and new media versions of your project and then compare their affordances. Following Lev Manovich, new media are represented numerically, automated, variable, modular, and transcoded (both computational/technical and cultural).
- *Media Survey*: Describe your project through a survey of media variously defined. Media may connect but also draw boundaries between this and that. Try describing your project as a window (through), portal (to), frame (around), link (between), container (in), address (at), negotiation (with), agent (for), and record (of). This list isn't exhaustive, but it's a start. It may help to articulate a language for your project.
- *Index/Icon/Symbol*: Render your project as an index (such as data, which points to something), an icon (such as an image that represents an app on your phone), and symbols (such as a tagline of words that produce meaning for people). This approach underscores how your project is not only designed but also communicated.
- *Reverse-Engineering*: Find a thing resembling your project, take it apart, trace the parts and their histories, and put the thing back together. Document the process and reflect on how it pertains to technology as congealed labour. (You can also have someone else reverse-engineer your project.)
- *Personas*: Create fictional characters to better understand a past or future scenario for your project. Use the personas to address how such representations are reductive and

problematic yet quite common in marketing. You can also use personas to highlight how and why you cannot inhabit the past.

- *Force Map*: Integrate your personas into a static illustration with a setting (time and place), concerns (expressed by the personas), media (what mediates the concerns and relations between personas), and relations (lines connecting personas and concerns). This map should illustrate your project as a social and material process. It should also reveal what you don't (yet) know.
- *Use Story*: Animate your personas and force map by storyboarding a context of use for your project. Try 3-6 panels of content, which may resemble a comic book or graphic novel. Perform and even video-record the storyboard, if you wish. Storyboarding situates otherwise abstract representations (such as exploded-view drawings) and foregrounds the importance of embodied experiences and social relations to project design and development.
- *Playtest or Workshop*: Circulate your project for feedback. Give groups specific problems or issues on which to focus. Later, conduct another workshop, where you don't intervene or guide the participants; be a fly on the wall, observe them interacting with your project, and take notes.
- *Datification*: Prototype your project with data in mind. Cook up a data model (entities, attributes for each entity, and relations between entities), some sample data, and an example of use. For whom is the data produced? By whom? How? Under what assumptions? How transparent is the process? How do people consent to and participate in it? Such prototypes should prompt considerations of control, surveillance, play (or gamification), and labour.
- *Dystopia/Utopia*: Integrate your datification into two dramatically different scenarios: one where the results are ostensibly positive, and one where the results are ostensibly negative. Articulate why you think the results are positive and negative, and also why technology is even necessary to achieve them.
- *Design Brief*: Compose a design brief for your prototype. Include your project's social *aim* (a specific social issue supported by peer-reviewed research), intended *audience* (a specific group for whom your project is designed), *context* (a particular place or situation), core *parts* (the primary ingredients of your prototype), *aesthetics* (affordances, or how your prototype engages people), *responsibilities* (what the project may change or affect, who will be responsible for those changes, and how), and *focus* (what the project won't or doesn't do). Provide example materials, too, such as illustrations, wireframes, photographs, code, video, and/or tactile prototypes. Design briefs are often written by firms and oriented toward clients or customers, but this version is intended to engage the course material.