What is a Design Brief?

This document is a guide to writing the Design Brief. In addition to this explanation, you should also look at the textbook Chapter 4, focusing on Stages 1-3 of the Design Report. Those are the elements of the design report that go into a Design Brief.

To the question: What is a Design Brief? Fundamentally, it is a document that a design team uses to establish the requirements that will invite design ideas that satisfy an opportunity. It is what is handed out at the beginning of a hack-a-thon, or by a client looking for contractors to present alternatives. It is also the little version to the "Request for Proposal" (RFP), a document you will write next term. The goal of the Design Brief is to set a team off in the right direction.

A Design Brief is aimed at a responding design team (which might be yourselves) who want to provide a good solution to the opportunity defined. They need to know what makes a solution "good" and they need to understand the nature of the opportunity (or problem) being solved. The responding team needs to know the boundaries of what is allowable in the design work and the nature of what is "better" or "worse." They do not need to know what you would make (your solution)—because if you already have a solution, why are you asking?

A good design brief creates an opening for multiple approaches to an opportunity. One test we use regularly with Briefs is the 5X5 test—can you brainstorm 5 completely different solutions in 5 minutes. If not, maybe the design space is overly restricted, or maybe your problem is not very interesting. If there is only one solution, you don't need a Brief, and you never really had an opportunity to begin with.

This document covers four things specific to what you are working on:

1. The logic of a Design Brief
2. The role of the Claim in a Design Brief
3. How the Design Brief sets up Requirements
4. How the Design Brief sets up future work.

Defining a "Problem" as the Logic of a Design Brief

Engineering is regularly called a "problem-solving" discipline. So, it should be no surprise that "problem" lies at the centre of a Design Brief. The trick is, you should understand "problem" to include

- problems—things that are broken, not working, or otherwise in need of change
- opportunities—things that are interesting, open up new possibilities, or otherwise improve on or build the good
- challenges—things that seem like they could happen, should happen, or would be massively cool if they did. Things that are beyond the bounds of what we expect.

The problem with "problem" is that it sounds negative. Sometimes we use the fake word: "probletunity" just to remind ourselves that we can work in multiple directions. As long as we are clear that "problems" could actually be "opportunities" or "challenges," we can move forward.

Defining the "problem" is the goal of the Design Brief. It does **NOT** solve the problem. The Brief should demonstrate that the problem is worth solving. To do this, we need to have a clear understanding of the problem from multiple perspectives, both human and technical. The design brief balances these two pieces.

The Human Side of the Design Brief

The human side of the design brief involves three critical elements: stakeholders, interpretations, and values.

Stakeholders have been discussed in class. To get at stakeholders' interests, we might watch them, ask them, research them, or test with them. We do not simply do what they tell us because stakeholders may not understand the opportunity fully, or may seeit only from their perspective—that's their stake after all.

That's where **interpretation** comes in. We interpret our understanding of stakeholders' "need" (as opposed to what they want or say they need). This involves judgment and subjectivity—they're subjects and so are we, so that should be expected.

Finally, our **values** form an important part of design work. A team begins to establish its own unique perspective (framing) on a design opportunity. We see it in a particular way because … values. Many of your values can become measurable and quantifiable through a range of DfX. Say you value "efficiency"? Does that actually mean usability—number of steps in a task and amount of concentration required? Or, does it mean number of components (and therefore connects to both assembly and reliability)?

We introduced a few DfX; we encourage you to explore others. Perhaps your Design Brief is the first place where you can make those things matter by building them into what you are looking for in the design.

The Technical Side of the Design Brief

The Design Brief is a technical document that establishes requirements: objectives, metrics, constraints, and criteria for a work of design. This is, in fact, the hardest part of the brief. We have already discussed requirements, so review those resources.

We have also discussed Reference Designs (and will have more to say about them). They form an essential part of the Design Brief. Remember that reference designs do two major things:

1. They explore previous attempts to solve our opportunity (or a similar one). The weaknesses of those attempts help identify critical areas that need to be resolved for a design that resolves the brief to be satisfactory.
2. Reference designs show us features we want. These features do not need to be for the same kind of device. For example, I might be setting up the requirements for a new design of a super backpack, but I see an innovative handle on an umbrella. Then, I can add into my objectives for my super backpack that it have a balanced means of one-handed holding and offer the umbrella as a reference (note: you do not request the actual handle of the umbrella be included in the design).

In this way, reference designs guide designers to combine ideas in new ways. Admittedly, they represent a danger as well: they could 'anchor' a team to a particular idea because of the reference. That's a careful balance we like to strike in the Design Brief: giving some guidance without narrowing the range of possibility.

The Role of the Claim (and Argument) in the Design Brief

A Design Brief is not an essay that has a thesis, so argument does not function like that. However, it is a document that makes three types of claim, each of which is essential to the success of the Brief.

1. The claim that the stakeholder interpretation is legitimate. Admittedly, you do not come out and say, "This interpretation is legitimate." However, you do make claims about the

stakeholder that need to be well justified by evidence from research and observation as noted above.

2. Each objective is a claim. Essentially, you are claiming that something with those goals and intentions will meet the identified opportunity. Part of how you support that claim is by having a logical process for measuring and evaluating (so, the rest of requirements).
3. Each metric, criterion or constraint is a claim. In putting forward a metric, you are *claiming* that it will measure what you want it to measure, and allow someone to make a judgment about a design. Each one needs to be defended with research, reasoning, or both.

Requirements Make the Design Brief

While all of the components of the Brief are important, the Requirements are the element that defines the quality and usability of the Brief. As noted above, several types of claims appear in the requirements.

Below is a sample from the textbook (p.99) which shows a set of requirements being presented as a table. Notice that the requirements move from a high level objective (1) to more detailed objectives (1.1-1.3), and they categorize criteria differently than we have discussed in class. As they go down, each of the more detailed objectives is justified by

TABLE 4.3 **A Partial Summary of Requirements from the Student Design Team's Mop RFP**

Objectives	Criteria		Constraints
	Metrics	Gradient	
1. Reduce Repetitive Strain Injury related to mopping			
1.1. Minimize the wringing effort input by the user	The average force exerted by human arms (N)	Lower is preferred	Less than current wring force exerted. To reduce RSI the applied force needs to be less than 100N as per MILSTD-1472D
1.2. Minimize the number of wringing cycles	• Number of wringing cycles/day. • If proposal is a process then the objective is met.	Lower is preferred	Less than 86 wringing cycles per day (based on a 10% reduction from current estimates of 96 cycles/day)
1.3. Improve posture	The difference between the solutions' working height and recommended working height (APPENDIX B)	Lower is preferred	Less than 0.5m difference between the proposed solutions' working height and the recommended working height as per MILSTD-1472D methods outlined in APPENDIX B

research, such as a Military Standard (MILSTD).[1] The key here is that it is clear which metrics, criteria and constraints are associated with each objective.

As we have stressed in class, you do not want to make arbitrary constraints. The constraint related to 1.2 in the table has that problem—why 10% reduction? What if my design achieved 9.5% reduction? Or—as you can see from the design discussed on p.105—what if we threw out that constraint all together but still met the higher objective?

Set up the Future

Remember that the Design Brief is a starting point, not an end point.

If your Brief works well, it allows teams to generate a range of ideas and have the confidence that they can assess them in meaningful ways. The design team may push back and ignore some of your metrics either because they're irrelevant to their design or because they have prioritized objectives differently.

A Brief is not a set-in-stone "thou shalt," but it is a meaningful guide that will allow teams to move forward and develop concepts that satisfy the intention.

[1] Pro-tip: MILSTD1472D happens to be the standard that deals with ergonomic design for the human body. It may be useful to some of you even in this brief. It's available online.