

A very short guide to the design process

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ITERATION

Design is an untidy cyclical process of making mistakes, learning from them, making more mistakes, learning from them, and so on until you have a design that you are happy with.

You will have numerous failures, dead ends, and discarded ideas. This is *normal* in any creative process worthy of the name.

The key is to make these mistakes as quickly and cheaply as possible. You do this by...

EXTERNALISATION

You need to get ideas out of your head in order to be able to assess their virtues and deficiencies, develop them, and communicate them to others.

Work on paper using sketches and notes to generate, explore, and assess your ideas. This is very cheap, quick, and productive, and you can do it anywhere. But there always comes a point where the medium of paper is too limiting.

Work in 3D making prototypes. These can vary from a model knocked up in a few minutes from the first materials that come to hand, to something very close to the final product. Making prototypes is slower and more expensive than sketching, but it's less limiting, and is usually the only way to produce something that you can test with users.

You'll flip back and forth between these two styles of working, according to whichever will advance your design most rapidly at any given juncture.

Externalisation is a way of facilitating your thinking, of which two kinds are...

DIVERGENT AND CONVERGENT THINKING

Any design process needs lots of ideas. Generating ideas is *divergent thinking*. It is free-flowing, usually non-judgemental, and doesn't follow a linear sequence.

Assessing your ideas and sifting through them to choose the best one to take forward is *convergent thinking*. It's less free-flowing than divergent thinking, and more determined by what you're ultimately trying to achieve.

The broad-brush picture of a design process typically involves divergence followed by convergence. If there isn't a well-defined design problem there may be two such big cycles. But during the development of your chosen idea you'll constantly flip back and forth between divergent and convergent thinking, as you resolve finer and finer aspects of your design.

Elements of a possible design process

This assumes that you already have reasonably well-defined goal. Eg “We want a hands-on exhibit about refraction of light”. If you have to generate your own goal, for example if the question is “we want a hands-on exhibition”, you may do stages 2 and 3 twice.

1. *Research the area* so that your knowledge is adequate for the purpose. I am inclined *not* to research what others have done on the same theme, because this can limit your own idea generation (but perhaps do this before stage 3 below).

2. *Generate as many ideas as possible*. Record the ideas with simple annotated sketches, just enough to make it clear what the essence of each idea is. Go for quantity not quality. Take your time. Don't try to judge your ideas at this point. Feel free to combine aspects of different ideas to generate new ones. Force yourself to have more ideas, even if you think you've just come up with a winner.

3. *Select an idea to take forward*. This is a crucial step, and should be done diligently. In the end, the choice will be your judgement: there is no mathematical procedure for picking the best idea. A possible sequence might be to use quick judgement to make a short list, then to explore the short-listed ideas on paper (maybe with some simple prototyping) to assess and record their strengths and weaknesses, to give you a basis for your final choice.

4. *Develop the chosen idea*. This will be the bulk of the design effort, as you turn the idea into the final product. You'll go through several iterations to resolve the coarse, then the fine details of the design. There'll be a lot of thinking on paper, but this is also where you'll be doing your prototyping and testing. Don't let yourself be trapped by how you happened to first sketch the chosen idea: try to identify the essence of the idea and be open to all of the possible ways in which that essence might be realised.

Strategy

Give your ideas a good shot, but you must be prepared to ditch them if they don't work out, no matter how much you love them.

Make your prototypes good enough. A badly-made prototype can make a perfectly good idea look like a failure. Be clear about what questions you want a given prototype to address, and make it good enough to answer those questions (but no better).

If there are unknowns that might completely scupper your idea, don't shy away from them. Investigate them as early as possible so that you've got time to develop an alternative idea if necessary.

Record all your thinking and prototyping. You may think you'll remember, but you won't.