

You would use this approach as part of the design process to select the best concepts that meet the Product Design Specification (PDS).

Projected performance gains



Identify

- The best product concepts that meet the PDS.



Improved

- Generating a consensus amongst the team to back the best product concepts
- The likelihood of creating a new product that will sell and meet profit margin targets
- Speed of design process, by accelerating decision making.

What investment is needed to understand the concept?

DIFFICULTY



Medium

Requires some reading around the subject and a structured approach.

ACTIVITY



Team

Best results come from a team including sales, marketing, design engineers, procurement, process engineers and assembly operators.

EQUIPMENT



None

No equipment is needed.

Explanation of the concept

Concept Selection is picking the idea(s) which best satisfy the PDS and would follow in the design process after:

- Understanding customer needs
- Developing PDS
- Generating many concepts.

In other words, before detailed design begins.

Steps to Construct / Design Pugh Matrix

One well known Concept Selection Matrix is the Pugh Matrix. An example is shown here on the right.

1. Choose or Develop the Criteria for Comparison

- Examine customer requirements to do this
- Generate a set of engineering requirements and targets.

2. Select the Alternatives to be Compared

The alternatives are the different ideas developed during concept generation. All concepts should be compared at the same level of generalization and in similar language.

PUGH CHART

	CAMERA W/ FACIAL RECOG.	DIGITAL SCRAPBOOK	PHOTO SCRAMBLER APP	LIVE FEED PARTY PROJECTOR	POV CAMERA W/STRAPS
AM I PERSONALLY INTERESTED?	S	+	+	S	+
DOES THE IDEA HAVE COMPETITIVE ADV?	S	+	S	+	S
IS THERE A CLEAR NEED?	S	+	+	+	S
ARE THERE GOOD MARKET OPPORTUNITIES?	S	+	S	S	+
HOW BIG IS THE IMPACT OF IDEA?	S	+	S	S	S
CAN I COMM. IT CLEARLY?	S	+	+	S	S

3. Generate Scores

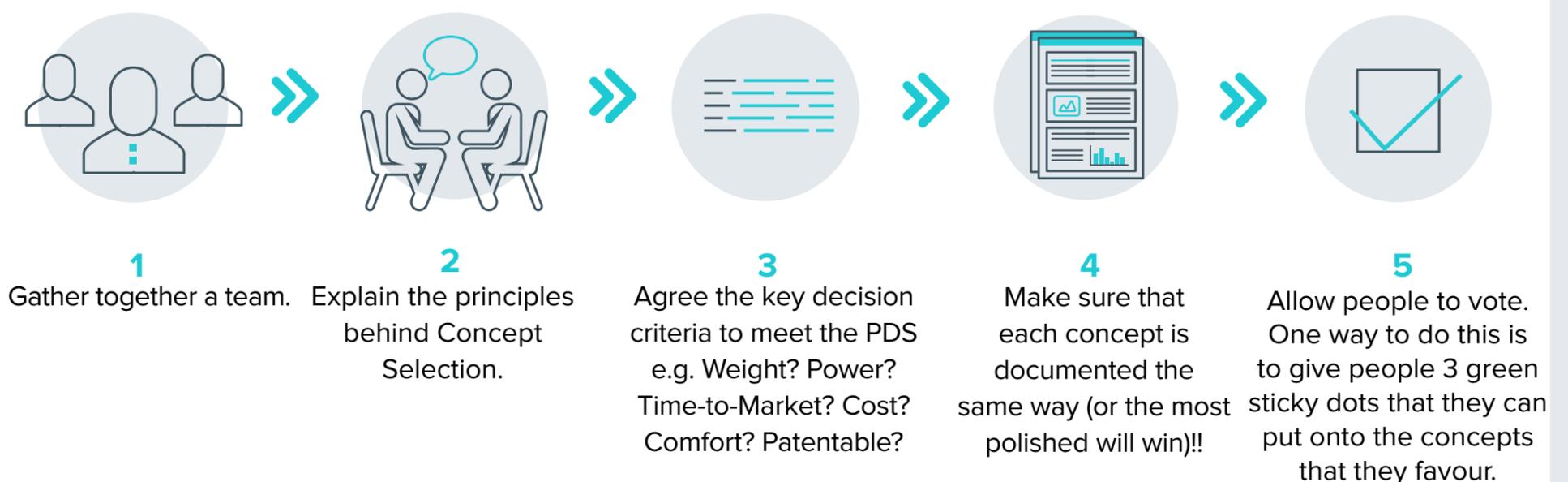
Usually designers will have a favourite design by the time it comes to pick one. This product concept can be used as datum, with all the others being compared to it as measured by each of the customer requirements. If the problem is to redesign an existing product, then the existing product can be used as the datum.

For each comparison the product should be evaluated as being better (+), the same (S), or worse (-). Alternatively, if the matrix is developed with a spreadsheet like Excel, use +1, 0, and -1 for the ratings. If it is impossible to make a comparison, more information should be developed.

4. Compute the Total Score

- Four scores will be generated, the number of plus scores, minus scores, the overall total and the weighted total.
- The overall total is the number of minus scores subtracted from the number of plus scores.
- The weighted total is the scores times their respective weighting factors, added up.
- The totals should not be treated as absolute in the decision-making process but as guidance only.
- If the two top scores are very close or very similar, then they should be examined more closely to make a more informed decision.

What action should I take?



Recommended Reading



Decision Matrix in Plain English, Lauren S: <https://www.youtube.com/watch?v=UAXiKVjaz1o>

Glossary

Product Design Specification (PDS) – A statement of how a design is made, what it is intended to do, and how far it complies with the customer’s requirements.

For more advice, case studies and additional factsheets visit:
www.businessgrowthhub.com/manufacturing