

ME450: PUGH CHART WORKSHEET

A Pugh chart is a simple design tool for comparing design ideas against your design criteria early in the design process. To draw a Pugh chart, list the design criteria in the left column. Weight each criterion according to how important it is (use any scale you like). Then list the design alternatives across the first row. Choose one design alternative as a datum. The datum should be a somewhat average design (not the best or worst idea). Then, rate how well each design meets each design criteria relative to the datum. You can use a scale like [-, -, -, -, 0, +, ++, +++]. When you are finished, total the points for each design alternative by multiplying +'s and -'s by the weights and summing. The design with the highest number is not necessarily the best design; however, if the numbers go against your intuition, reexamine your ratings and weights. The purpose of the Pugh chart is to get you to systematically think of the pros and cons of each design alternative relative to your design criteria.

The Pugh chart to the right is a sample from a student design project. The goal of this project was to develop a product to assist elderly and handicapped people in showering and transferring into and out of the shower unit.

The sample blank chart on the following page can be used to start considering your ideas. It also provides space to make a small sketch of each concept. Remember, these are only samples. Feel free to make your own chart. The goal of this exercise is to have you systematically think about your design alternatives and design criteria.

Problem Area: Many elderly people have difficulty with balancing while showering and while transferring into and out of the tub.							
Design Criteria	Weight	Shower Steps	Swivel Chair w/ Hinge Leg	Hydraulic Swivel Chair	Pivoting Tub	Shower Grips	Tub Door
Aesthetics	2	+	<i>D</i>	0	-	++	+
Cost	2	+	<i>A</i>	-	---	+++	0
Installation	2	--	<i>T</i>	0	---	-	--
Safety	2	-	<i>U</i>	-	---	-	++
Ease of Use	2	-	<i>M</i>	+	-	++	++
Maintenance	1	+	.	-	---	+	-
Speed	1	-	<i>D</i>	-	---	0	+
Comfort	2	-	<i>A</i>	+	+	-	0
Noise	1	0	<i>T</i>	-	---	0	0
Space	2	---	<i>U</i>	0	---	++	++
Universal	1	-	<i>M</i>	0	---	++	+++
			.				
	+	5	0	4	2	21	18
	0	1	18	7	0	2	5
	-	18	0	7	40	6	5
		-13	0	-3	-38	15	13

"Pugh (developed) a method of winnowing multiple new product concepts which he terms 'controlled convergence'¹. In essence, Pugh suggests that each member of the design team independently generate conceptual solutions to the design problem. The competing ideas are then compared to a standard datum, selected for its typicality in the product category, and are evaluated as being better than, equal to, or inferior to the datum on the key dimensions that will contribute to product success. The group proceeds to eliminate weaker ideas, but also attempts to cull the advantages of each concept and incorporate it into the remaining ones before discarding it. In this way, the 'winning' concept incorporates many of the best ideas of all of the other concepts."²

¹ Pugh, A. (1996), Creating Innovative Products Using Total Design: The Living Legacy of Stuart Pugh, Editors: Don Clausing and Ron Andrade

² Quote taken from Dahan, E. and J. Hauser "Managing a Dispersed Product Development Process" October 2000 <http://web.mit.edu/hauser/www/Pages/ha53601.pdf> (referenced Aug 2001)

