

UDesign Process User's Guide

The UDesign Process, adapted from Clausing¹ and Pugh², is made up of five phases: Definition, Requirements, Benchmarking, Concepts, and the Go/No-Go Review. Figure 1 depicts the fundamental components, along with some of the characteristics of each phase.

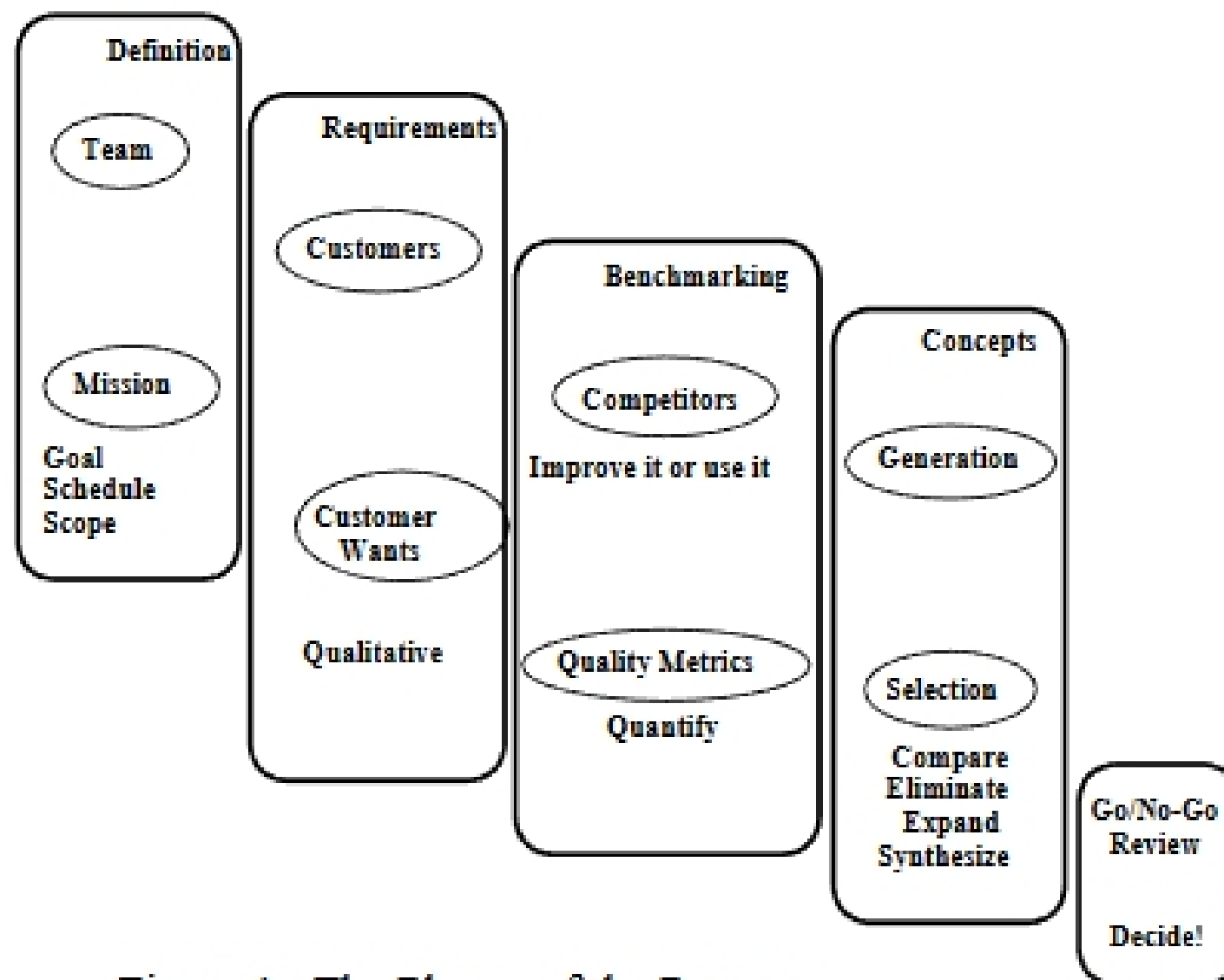


Figure 1. The Phases of the Process

This User's Guide is intended to help the team master the "mechanics" of a project. "Session" numbers listed below do not, in most cases, refer to the exact number of times a team will convene on a given project. Rather, they represent logical breaks in the flow of a typical project.

¹ Clausing, D. P., Total Quality Development, ASME Press, 1994.

² Pugh, S., Total Design, Addison-Wesley, 1990.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1	Customer Data and Wants Formulation														
2															
3	Project Title:														
4	Mission Statement:														
5															
6															
7	Customer Information							Want Information							
8	Rank who is the most important customer?							Priority							
9															
10			10	0.45	0.25	0.15	0.1	0.05							
11	Name	Organization	Rank	1st Want	2nd Want	3rd Want	4th Want	5th Want	Use this space for other identified wants						
12	Person1	Org1	1	want1	want2	want3	want4	want5							
13	Person2	Org2	2	want3	want5	want6	want7	want8							
14	Person3	Org3	3	want1	want2	want4	want5	want6							
15															
16															
17															
18															
19															
20															
21															
22	Partner Information							Constraints							
23								want	score	ordered	want	score	Order/SU		
24	Name	Organization	Rank	1st	2nd	3rd	4th	5th	want1	5.4	1	want1	5.4	25.4	
25									want2	2.5	2	want2	2.75	24.6	
26									want3	3.75	3	want3	2.5	16.4	
27									want4	1.2	4	want4	1.2	0.5	
28									want5	0.7	5	want5	0.75	4.5	
29									want6	0.75	6	want6	0.7	4.6	
30									want7	0.5	7	want7	0.5	2.3	
31									want8	0.25	8	want8	0.25	2.3	
32												SUM	13.25		
33															
34															
35															
36															
37															
38															
39															
40															
41															
42															
43															
44															
45															
46															
47	Interested Party Information							Constraints							
48															
49															

Figure 2. Customer Wants

This first spreadsheet (Fig. 2) is used to state the team's mission, and make a list of customers and wants. Customers are also known as clients, stakeholders, or constituents. They care about the task you are performing. Develop a sharp, one-sentence statement of the mission of this UDesign project or subproject. In making the customer list, use first and last names of real people whenever possible. Make a complete list of all possible external and internal customers. Consider converting internal customers into partners. In other words, get a buy-in from them to join the team as a member or consultant. Members are responsible for decisions, while consultants only provide information. Partners may provide serious constraints that will limit the scope of the possible solutions.

Once the first-pass list of customers is done, continue the session to brainstorm the wants of each customer. Some categories of wants to include are economic (Value is defined as dollar value of benefit divided by dollar value of cost to implement), environmental, manufacturability, sustainability, and health or safety issues. Sometimes, especially in publicly funded projects, social and political considerations may be critical. Industry standards are often important wants. Finally, the ethics of each want must be addressed.

Role-play each customer. Enter the results as you go alongside each customer's name. Duplications are fine. Just be as complete as possible. Conflicting wants are common, and are particularly useful to sharpen the decisions to be made. Continue to add wants, and even more customers until the team is satisfied. Consensus is sought for each team decision. Understanding the conflicting opinions is necessary. Make the decisions and keep moving forward. Speed is especially useful early on. Iterations are expected and welcomed, but not too many sub-iterations.

This wants information is critical to the success of a design project. To be effective, it must be organized in priority order. A recommended method for ordering the wants is shown on the right hand side of Figure 2.

List the wants. Give each want a score based on the importance of the customer to the project (rank from Column 3), and the importance of that want to that customer (use values from Row 9). The formula for the score is shown in the example calculations in the spreadsheet.

Copy and paste the wants and scores into columns 12 and 13 (use "paste special" to only transfer values). Use the "sort" function in Excel to put the wants in order of their score. Add the column into "SUM". Use the last column to calculate the percent importance. Then transfer the results to the next sheet of the spreadsheet, as shown in Figure 3. Now the team and its management can see the relative importance of the wants. This also begins the process of linking the priorities back to individual customer representatives. When the situation changes based on new information, the customer priorities must be re-confirmed and re-linked.

Ranking	Want Description	Importance
1	want1	35
2	want3	25
3	want2	16
4	want4	9
5	want6	5
6	want5	5
7	want7	3
8	want8	2
9		
10		

Figure 3. Top Ten Wants