

- A Pairwise Comparison Chart allows for a relative ranking of the major design objectives.
- Identify the top 4-7 design objectives.
- If working for a client, have the client complete the PCC based on what they feel is most important.
- Use the results of the PCC to determine what objectives have the highest priority.

The process involves comparing each objective to the others, one at a time.

- Place each of the key objectives in a row across the top of the chart and in a column down the left-hand side.
- For each row, compare the row objective to each column objective.
- If the row objective is more important than the column objective, place a "1" in the cell.
 If the column objective is more important than
- If the column objective is more important than the row objective, place a "0" in the cell.
 Add up the value in each row to determine the total
- Add up the value in each row to determine the total score for that row objective. The higher the total, the higher priority that objective has.



Developing a PCC for a ladder design. • Second row • Portability is more important than $\cot \rightarrow 1$ • Portability is more important than usefulness $\rightarrow 1$ • Portability is more important than durability $\rightarrow 1$ • Portability is more important than durability $\rightarrow 1$ • The total score for portability is 3. Second Seco

| Third ro | w | | | | |
|---|----------------|---------------------------|-------------------------------|-----------------------------------|------------------------|
| Heaf | | | | | |
| - Usen | Iness i | s more in | portant t | han cost | →1 |
| - Usefi | Inessi | s less im | nortant th | an nortal | ility -> 0 |
| Lloof | Incod | | montont t | hon dural | |
| - Useri | linessi | s more in | iportant t | nan durai | $DIIITV \rightarrow 1$ |
| | | | | | |
| - The t | otal sco | ore for us | efulness i | s 2. | |
| - The t | otal sco | ore for us | efulness i | s 2. | |
| - The t | Cost | Portability | efulness i Usefulness | s 2. Durability | Score |
| - The t Goals Cost | Cost | Portability | efulness i Usefulness 0 | S 2. Durability | Score 1 |
| - The to Goals Cost Portability | Cost | Portability 0 | Usefulness i | S 2. Durability 1 1 | Score 1 3 |
| - The t Goals Cost Portability Usefulness | Cost 1 1 | Portability 0 0 | Usefulness i | S 2. Durability 1 1 1 | 5core 1 3 2 |

| eloping a PCC for a ladder design. | | | | | | 14 | design objectives. | | | |
|---|--|---|---|---|--|----|--|--|--|--|
| Fourth row - Durability is less important than cost → 0 - Durability is less important than portability → 0 - Durability is less important than usefulness → 0 - The total score for durability is 0. | | | | | | - | Of the objectives listed, the prioritized list is I. Portability | | | |
| Dura Dural The t | bility is bility is otal sco Cost | less impo less impo pre for dui | ortant that ortant that rability is | n portabi n usefulr 0. Durability | lity $\rightarrow 0$ less $\rightarrow 0$ score | | 2. Usefulness 3. Cost 4. Durability | | | |
| - Dura - Dura - The t | bility is bility is otal sco Cost | less impo less impo pre for dui Portability 0 | ortant that ortant that rability is Usefulness 0 | n portabi n usefulr 0. Durability 1 | $\frac{\text{lity} \rightarrow 0}{\text{ness} \rightarrow 0}$ $\frac{\text{Score}}{1}$ | | 2. Usefulness 3. Cost 4. Durability • The fact that durability scored a "0" on the PCC does not mean that we can drop durability from the list of | | | |
| - Dura - Dura - The to als st rtability | bility is bility is otal sco Cost 1 | less impo less impo pre for dui Portability 0 | ortant that ortant that rability is Usefulness 0 1 | n portabl n usefulr 0. Durability 1 1 | $\frac{\text{lity} \rightarrow 0}{\text{ness} \rightarrow 0}$ $\frac{\text{Score}}{1}$ 3 | | 2. Usefulness 3. Cost 4. Durability The fact that durability scored a "0" on the PCC does not mean that we can drop durability from the list of oblectives. It use means that of the four oblectives | | | |
| - Dura - Dura - The to oals ost xrtability sefulness | bility is bility is otal sco Cost 1 1 | Portability 0 0 0 | usefulness 0 1 | n portabi n usefulr 0. Durability 1 1 1 | $\frac{\text{lity} \rightarrow 0}{\text{less} \rightarrow 0}$ $\frac{\text{Score}}{1}$ $\frac{3}{2}$ | | 2. Usefulness 3. Cost 4. Durability • The fact that durability scored a "0" on the PCC does not mean that we can drop durability from the list of objectives. It just means that of the four objectives listed, durability is the least important. | | | |

| | 1 | 12 | | | - | |
|------------------------|-------|----------------|---------------|------------------------|--------------------|-------|
| Objectives | Speed | Drive Power | Lift Power | Degrees-of- freedom | Simple Controls | Score |
| Speed | | 1 | 1 | 1 | 1 | 4 |
| Drive Power | 0 | | 1 | 0 | 0 | 1 |
| Lift Power | 0 | 0 | | 1 - | 0 | 1 |
| Degrees-of- freedom | 0 | 1 | 0 | | 0 | 1 |
| Simple Controls | 0 | 1 | 1 | 1 | | 3 |