

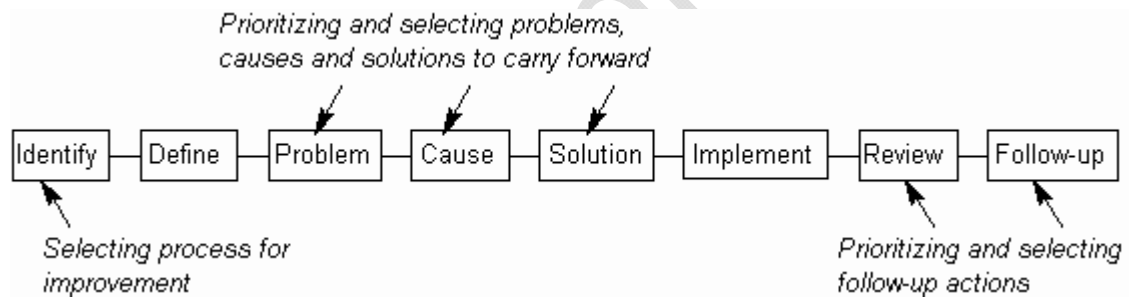
Prioritization Matrix

The Prioritization Matrix provides a way of sorting a diverse set of items into an order of importance. It also enables their *relative* importance to be identified by deriving a numerical value of the importance of each item. Thus an item with a score of 223 is clearly far more important than one with a score of 23, but is not much more important than one with a score of 219.

In order that the items can be compared with one another in this way, each item is scored against each of a set of key criteria, and the scores for each item are then summed.

I. When to use it

- Use it to prioritize complex or unclear issues, where there are multiple criteria for deciding importance.
- Use it when there is data available to help score criteria and issues.
- Use it to help select items to be actioned from a larger list of possible items.
- When used with a group, it will help to gain agreement on priorities and key issues.
- Use it, rather than simple Voting, when the extra effort that is required to find a more confident selection is considered to be worthwhile.



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II. How to understand it

Deciding what is really important from a list of issues can be very difficult, especially if there is no objective data available and the people involved have a difference of opinion about which should be acted upon first. For example, when customers are asking for a list of product enhancements, how do you decide which to implement?

A good criterion reflects key goals and enables objective measurements to be made. Thus 'material cost' is measurable and reflects a business profit goal, whilst 'simplicity' may not reflect any goals and be difficult to score.

When there are multiple criteria, it may also be important to take into account the fact that some criteria are more important than others. This can be implemented by allocating *weighting* values to each criteria, as shown below.

Criteria provide common method of judging items to be prioritized

Criteria are prioritized by weighting values (e.g. 4 means twice as important as 2)

Items to prioritize \ Criteria:	Low cost of implementation Weight = 2	High increase in sales Weight = 4	Final score
Add a fold-away handle	3	2	14
Reduce the weight	2	4	20
Use brighter prints	5	3	22

Items scored against criteria

Weighted score is score x weight (e.g. 3 x 2 = 6)

Weighted scores added for final score (e.g. 4 + 16 = 20)

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III. How to do it

1. Identify the overall objective. For example, 'Increase the profitability of the umbrella product line'.
2. Gather the people who are to work on the problem. They should, between them, understand the problem area and how items on the list may be judged.
3. Produce the list of items to be prioritized. This may be done using other tools, such as Brainstorming or Surveys.
4. Identify a list of criteria which may be used to judge how well each item on the list from step 3 serves the objective from step 1. This may be a fairly long list, but is reduced in steps 5 and 6.

Approaches to identifying criteria may include:

- ❖ Analyze the statement of objectives (e.g. What are the components of profit?).
- ❖ Identify practical constraints (e.g. How easy is it to do?).
- ❖ Consider the benefits, costs and risks.
- ❖ Aim for criteria that can be measured objectively and easily, rather than subjectively or with difficulty.

Word the criteria such that it is clear that agreeing with them is desirable. Thus use 'Low cost of ownership', rather than 'Ownership cost'.

5. Allocate a weighting number to each criterion to show their relative importance in achieving the overall objective. Thus a criterion with a number of 4 is twice as important as one with a number of 2.

When allocating numbers in a group, if consensus cannot be reached, give each person the same number of points to spread amongst the criteria or use some other Voting method.

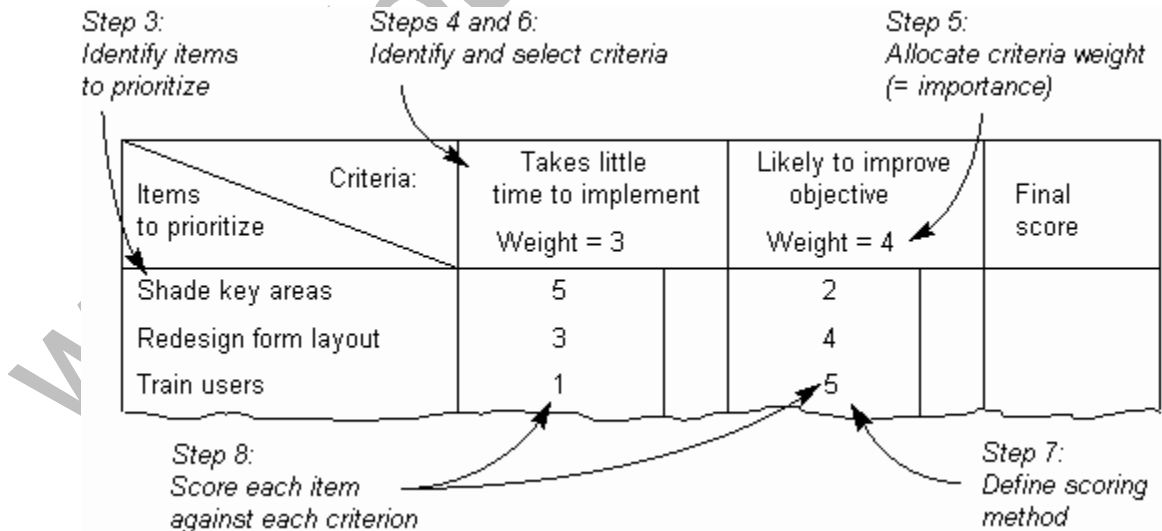
6. Select the actual criteria to use against the list items to be prioritized. This may be done by:
 - ❖ Rejecting criteria which have an importance number which is much lower than others.
 - ❖ Reducing the number of criteria to a small and manageable number, typically around three, by selecting those with the highest importance number.
7. Define how the list items from step 3 will be scored against each of the criteria identified in step 6.

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Approaches to consider include:

- ❖ Have a limited set of possible score values, with associated text to describe what they mean. Thus a score of 4 may mean 'item strongly supports the criterion'.
- ❖ Use a Voting system, as in step 5, where each person has a fixed number of points to distribute across items.
- ❖ Use negative scores for negative effects. An example is where the criterion is 'reduces manufacturing cost', but the list item actually *increases* manufacturing cost.
- ❖ Use a percentage scale either for direct scoring or to convert the final score into a percentage. This makes it easier to deduce information, for example if one item has a score of 64%, it is clear that all other scores against this criterion total only 36%.
- ❖ Score each item against each criterion, using the method identified in step 7, as in the illustration below.

If actual numerical values are available for these comparisons, translate the values into the same score range as identified in step 7. For example, if actual costs are available, but the scoring system uses a total of 100, then divide each cost by the total of all costs and multiply by 100.



8. Multiply each score from step 8 by the number allocated to the appropriate criterion in step 5 to get the weighted score for each item against each criterion, as in the figure below.

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9. For each item, add up all of the weighted scores from step 8. This gives the final prioritizing score for each item, as in the figure below. The scores may left as they are or converted to percentage values.

Items to prioritize	Criteria:				Final score
	Takes little time to implement Weight = 3	Likely to improve objective Weight = 4			
Shade key areas	5	2	15	8	23
Redesign form layout	3	3	9	12	21
Train users	1	4	3	16	19

Step 9:
Calculate weighted scores for each item and criteria as $\text{Score} \times \text{Weight}$
e.g. $15 = 5 \times 3$

Step 10:
Calculate overall priority score for each item as sum of weighted scores
e.g. $19 = 3 + 16$

10. The final list of prioritized items may be made clearer for communication and decision making by sorting it into priority order and displaying it in a Pareto Chart.

IV. Example

The personnel department of a major manufacturer had a number of problems highlighted in a company motivation survey. They decided to work as a team on improving the survey score. To select aspects on which to focus, they decided to use a Prioritization Matrix with the top eight motivational problems and three selection criteria.

They discussed and agreed on distributing 100 weighting points between the criteria. Scoring of problems was done differently for each criterion, but then converted to a percentage before multiplying by the weight. This scheme resulted in final scores that were also percentage figures. Scoring of problems against criteria was done as follows:

- ❖ For the criterion of 'We are able to influence', the ability of the personnel department to effect a real change was discussed, and 100 points distributed between problems.
- ❖ For the criterion of 'Many people have problem', the actual number of people mentioning this problem in the survey was used and then converted to a percentage.
- ❖ For the criterion of 'Likely survey improvement', the improvement in the survey score in these areas if this problem was fully addressed was used and then converted to a percentage.

Prioritization Matrix

The figure below shows the Prioritization Matrix. Pay and work overload, as the highest scoring motivational problems, were selected for carrying forward for further investigation. As a result of consequent work in the project, the pay structure for certain grades was revised and training on job scheduling was introduced. In the following year, the survey improved in these areas by 2 and 3 points, respectively.

Motivation problems	Prioritization criteria:		Many people have problem		Likely survey improvement		Final score
	We are able to influence	Weight = 20	Weight = 30	Weight = 50			
Unhelpful management	25%	5.0	21 = 11%	3.2	2 = 9%	4.6	12.8
Insufficient pay	19%	3.8	29 = 15%	4.5	4 = 18%	9.1	17.4
Work overload	6%	1.2	36 = 18%	5.5	5 = 23%	11.4	18.1
Unclear objectives	20%	4.0	23 = 12%	3.5	3 = 14%	6.8	14.4
Inadequate tools	8%	1.6	45 = 23%	6.9	3 = 14%	6.8	15.3
Poor food in canteen	4%	0.8	21 = 11%	3.2	2 = 9%	4.6	8.6
Uncooperative workmates	13%	2.6	10 = 5%	1.5	2 = 9%	4.6	8.7
Untidy workplace	5%	1.0	10 = 5%	1.5	1 = 5%	2.3	4.8
Totals			195		22		100

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