

## MoP Practice: Prioritize. How to build a prioritization model?

The purpose of the prioritize practice is to support senior management, portfolio board or portfolio governance body to answer the following questions:

- Which initiatives are the right projects to invest in?
- What are the most important initiatives?
- What initiatives must be resourced above all other initiatives?

The official MoP manual stated that answering these questions is only possible when all initiatives have been prioritized. This prioritization can be done for the portfolio as a whole or when the portfolio has been divided into several categories or segments, for each category or segment.

In this article I will emphasis on the how. I will look at the approach and will go a step further than the manual to give you more in depth details what you have to do. E.g. the manual stated *“Agree the importance of each criterion by assigning a weighting or percentage of relative importance – and ensure that the total percentages of all criteria add up to 100”*. Sounds easy, but how can you decide and calculate which weighting or percentage of relative importance you have to use for each criterion?

This article is divided into the following paragraphs:

- Different types of metrics or selection criteria
- Single criterion analysis
- Multi-criteria analysis (MCA)
- Keys to successful prioritization

### Different types of metrics or selection criteria

There are many metrics to use. In general you can divide these metrics under different headings:

- The return or attractiveness of initiatives
- The risk or achievability of initiatives
- The affordability of initiatives

Which criterion to be used depends on your own situation.

A not limited list of possible metrics grouped under the main headings, are:

- Return or attractiveness
  - Financial return on investment
  - ‘Political’ need
  - Strategic impact
  - Strategic contribution
  - Supports at least one strategic objective
  - Addresses an area of underperformance
  - Confidence in benefits forecast
  - Stakeholder commitment to the business changes on which benefits realization is dependent
  - Realizes significant benefits in a short time with low risk
  - Net present value (NPV)
  - Interest rate return (IRR)

- Benefits cost ratio (BCR)
- Contributes to external targets
- Complies with a legislative requirement
- Improves efficiency
- Honors an existing contractual obligation
- Risk or achievability
  - Reputational risk
  - Likelihood of project delivery / confidence in initiative deliverability (BCG offers a simple tool, called DICE, to assess the likelihood of change initiative success and failure)
  - Likelihood of benefits realization
  - Complexity
    - Profile
    - Delivery challenge
    - Capacity and capability
    - Scale
  - Payback period
  - Quality of logical dependency management
  - Quality of logistical dependency management
  - Quality of risk management
  - Adequacy of resource provision
  - Delivery consequence assessment (part of OGC gateway process, confidence can be Green, Amber/Green, Amber, Amber/Red, Red)
  - Risk potential assessment (RPA)
  - Mitigates against corporate risk
- Affordability
  - Capital expenditure (CAPEX)
  - Operational expenditure (OPEX)

These metrics can be a monetary measure, e.g. NPV, a percentage measure, e.g. IRR, a time measure, e.g. payback period, a classification, e.g. strategic impact (mission critical, highly desirable, desirable), a range, e.g. 7-14: win, 15-17: worry, 18-28: woe.

In the next paragraphs I will explain how to set up a prioritization model using one single criterion and a prioritization model based on multiple criteria.

### Single Criterion Analysis

Using a single criterion to prioritize initiatives will give you a simple method and quick answers but has its drawbacks. Suppose you use the financial metric benefits, its use will be limited if you have initiatives which will not have immediate financial benefits, e.g. increase of customer satisfaction. To avoid this problem you could use a criterion, which can handle both, e.g. the return or attractiveness and compare pairwise initiative-by-initiative which is more or less important. To decide which criterion to use it's advisable to

15 years ago I used a simple brown paper with around 15 prioritized initiatives, which we put on the wall. When we discussed a new initiative, which had to be prioritized, we simply agreed (pairwise comparison) and placed it at the right place, on the brown paper. The initiative with the lowest priority fell off the brown paper (and was stopped or postponed).

make use of decision conferencing. Let senior management debate and agree on the to be selected criterion.

To perform a single criterion analysis use the following steps:

1. Select criterion
2. Compare pairwise initiative by initiative using “more or less important” as a score
3. Collate all prioritization information and analyze

An example:

We have six projects and we want to prioritize these six projects. We use attractiveness as the single criterion. See also figure 1. As a first step we compare the first project (Project A) with the other projects by answering the question “is the attractiveness of Project A more or less important than Project B, Project C, etc. In the matrix we fill in a 0 if it’s less and a 1 if the attractiveness is more important. The matrix part below the diagonal is the opposite of what you have filled above (If Project A is more attractive than Project B will give the answer for the question If Project B is more attractive than project A).

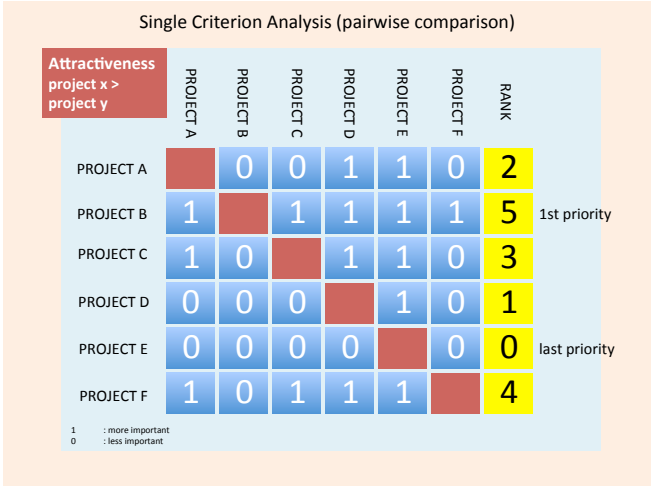


Figure 1: Single Criterion Analysis (pairwise comparison of attractiveness)

When all projects are compared pairwise we can calculate the ranking of each project (row by row). In this example Project A has a more important attractiveness than Project D and E resulting in a 2 score. See the yellow column in figure 1. The project with the highest score will have the highest priority. Project B has the highest priority and Project E the lowest.

In this example we used the attractiveness as the single criterion but what will happen if we choose, e.g. achievability as the single criterion? In figure 2 you can find the results.

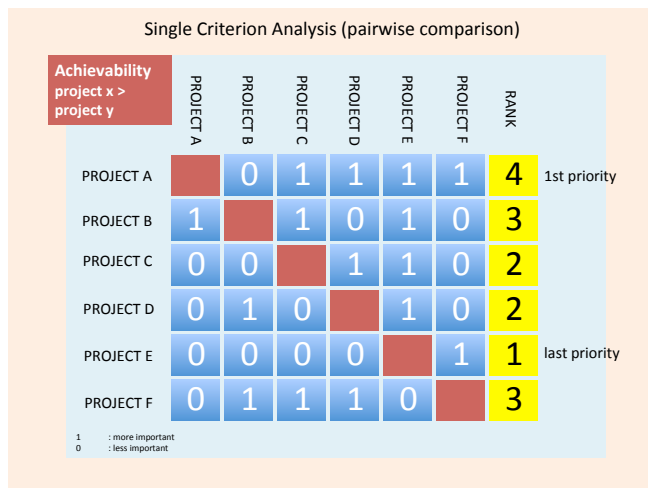


Figure 2: Single Criterion Analysis (pairwise comparison of achievability)

When using achievability as the single criterion Project A will have the highest priority. What does this mean? If we use attractiveness Project B has the highest priority and if we use achievability Project A has the highest priority. Difficult to decide, if we can only execute one project, which project to choose. To get the right answer we have to combine the metrics. It's also possible that you are in a situation that nobody ranks the projects in the same order. This what is know as Condorcet's paradox (see highlighted text box) and asks for more criteria to select too. In the next paragraph Multi Criteria Analysis will be explained.

## Multi Criteria Analysis

Multi criteria analysis gives you the possibility to prioritize a group of initiatives based on a set of weighted (sub) criteria.

To get senior management buy-in use decision conferencing to debate and agree on:

1. Select (sub) criteria
2. Develop corresponding weights
3. Agree on a rating system
4. Rate each initiative using the ratings and weightings identified
5. Collate all prioritization information and analyze

### Condorcet's paradox

The Condorcet's paradox occurs when a vote is taken on a set of three projects nobody ranks in the same order. If you use pairwise comparison and take the majority vote to decide if a project is more important than another project, the result will be that all three projects have the same rank. See Figure 2b.

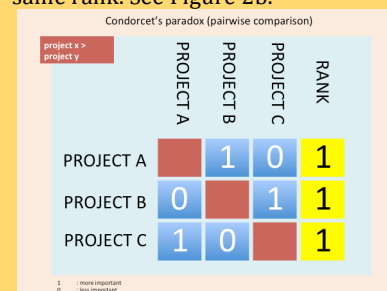


Figure 2b: Condorcet's paradox (pairwise comparison)

Even though a vote between two projects (pairwise comparison) may yield a consistent winner, it's impossible to achieve a consistent outcome between all three projects with one project with the highest priority.

Many organizations select their criteria under two or three main headings: attractiveness, achievability and affordability. Figure 3 is a generic example to define the relative weight of three criteria by using pairwise comparison.

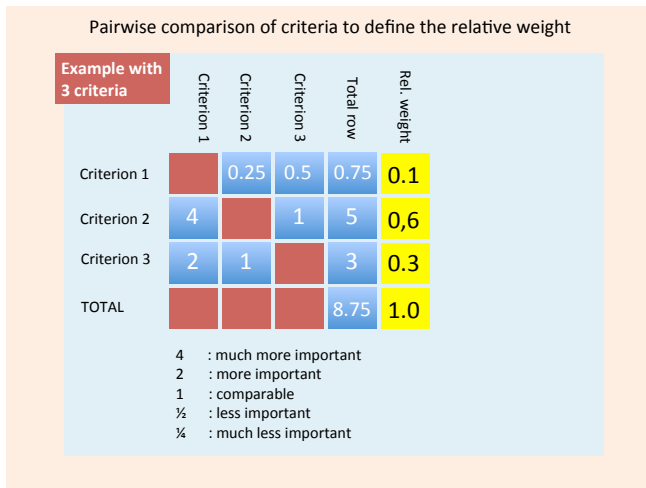


Figure 3: Pairwise comparison of criteria to define the relative weight.

Compare criterion 1 with the other criteria and decide if criterion 1 is more, less or comparable with the other criteria. Use the following scores:

- 4: much more important
- 2: more important
- 1: comparable
- ½: less important
- ¼: much less important

In the example criterion 1 is much less important than criterion 2 and less important than criterion 3. Criterion 2 is much more important than criterion 1 and comparable with criterion 3. By adding the scores row by row you get the total row score. As a final step you calculate the relative weight of each criterion by dividing the total of a row with the total of all rows. In this example criterion 2 is the most important criterion with a relative weight of 0.6 (60%). If, as a result one of the relative weights is less than 0.1, I would suggest skipping this criterion. It simplifies the model and the impact is negligible.

Select (sub) criteria and develop corresponding weights

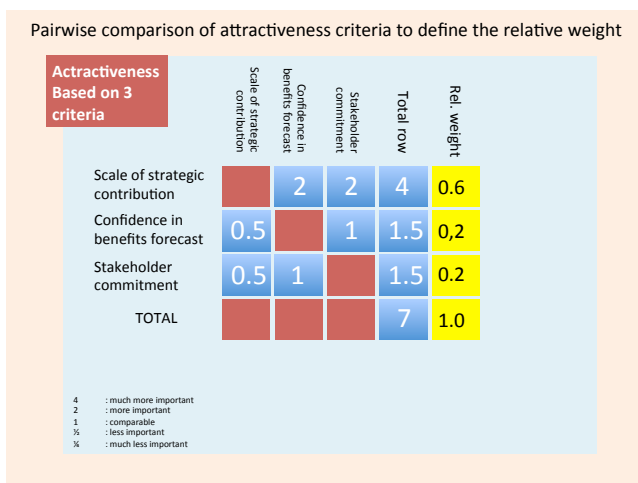


Figure 4: Pairwise comparison of attractiveness criteria to define the relative weight.

Figure 4 shows the calculation of the relative weight of the three sub criteria of attractiveness: Scale of strategic contribution, confidence in benefits forecast and stakeholder commitment. In this case the relative weight of strategic contribution (0.6) is three times more important than the other two criteria, which are equally important. Figure 5 does the same for the four sub criteria for achievability: quality of logical dependency management, quality of logistical dependency management, quality of risk management and adequacy of resource management. In this case the quality of risk management is twice as important as the other criteria.

Pairwise comparison of achievability criteria to define the relative weight

Achievability Based on 4 criteria	Quality of logical dependency mgt.	Quality of logistical dependency mgt.	Quality of risk management	Adequacy of resource provision	Total row	Rel. weight
Quality of logical dependency mgt.	1	0.5	1	2.5	0.2	
Quality of logistical dependency mgt.	1	1	0.5	2.5	0.2	
Quality of risk management	2	2	1	6.0	0.4	
Adequacy of resource provision	1	1	0.5	2.5	0.2	
<b>TOTAL</b>				<b>13.5</b>	<b>1.0</b>	

4 : much more important  
 2 : more important  
 1 : comparable  
 1/2 : less important  
 1/4 : much less important

Figure 5: Pairwise comparison of achievability criteria to define the relative weight.

Rating system

The next step, after defining the relative weight of the criteria, is to agree on a rating system or contribution of each criterion. Depending on the criterion a rating system can be set. Possible rating systems are (not imited):

- Range 0 – 10
- 0: no contribution, 5: some contribution, 10: high contribution
- 1: 0 - 100K €, 5: 100K – 500K €, 10: >500K € (revenues)
- 1: >500K €, 5: 100K – 500K €, 10: 0 - 100K € (costs)
- 1: desirable, 5: highly desirable, 10: mission critical

Agree on rating system

Attractiveness	Weighting	Contribution			Score	Total
		No	some	high		
Scale of strategic contribution	0.6	0	5	10	10	6
Confidence in benefits forecast	0.2	0	5	10	5	1
Stakeholder commitment	0.2	0	5	10	0	0
<b>Attractiveness score</b>					<b>7</b>	

	Weighting	Contribution	Score	Total
Scale of strategic contribution	0.6	0-10	10	6
Confidence in benefits forecast	0.2	0-10	4	0.8
Stakeholder commitment	0.2	0-10	1	0.2
<b>Attractiveness score</b>				<b>7</b>

Figure 6: rating systems for attractiveness

Figure 6 shows two different rating systems for the sub criteria of attractiveness and you can find the score for one initiative. In this case the scale of contribution is 10, relative weight is 0.6, gives a total of 6. In total you get a score of 7 for attractiveness.

Figure 7 does the same for the criterion affordability. In this case affordability has been divided into two sub-criteria capex and opex. Both have the same weight and capital expenditure is less than 100 € and has a score of 10, operational expenditure is more than 500K € and scores a 1. In total the affordability score is 5.5.

Agree on rating system

Affordability	Weighting	More than 500K €	100K-500K €	0-100K €	Score	Total
Capital expenditure	0.5	1	5	10	10	5
Operational expenditure	0,5	1	5	10	1	0.5
<b>Affordability score</b>						<b>5.5</b>

Figure 7: rating systems for affordability

In our example we now have three main criteria attractiveness, achievability and affordability with individual weighted sub-criteria and corresponding rating systems. Using pairwise comparison we can define the relative weight of each of these three main criteria (see for an explanation how to define the relative weight figure 3). In this case attractiveness is three times more important than achievability and affordability (see figure 8).

Pairwise comparison of criteria to define the relative weight

	Attractiveness	Achievability	Affordability	Total row	Rel. weight
Attractiveness		2	2	4	0.6
Achievability	0.5		1	1.5	0,2
Affordability	0.5	1		1.5	0.2
TOTAL				7	1.0

4 : much more important  
 2 : more important  
 1 : comparable  
 ½ : less important  
 ¼ : much less important

Attractiveness is three times more important than Achievability and Affordability.

Figure 8: Pairwise comparison of criteria to define the relative weight

Rate each initiative using the ratings and weightings identified

All ingredients for a portfolio prioritization model are now in place. Figure 9 gives the result. You see the three main headings attractiveness, achievability and affordability, including their mutual relative weight, all sub-criteria and their weights, the scores of the main headings and the overall score of the initiative. If we look at the sub-criteria scale of strategic contribution is got a score of 10. In the model this will lead to a total score of 10 multiplied with the relative weight of 0.6 and multiplied with the relative weight of attractiveness of 3, leading to a score of 18. In total the attractiveness score is 21, achievability score is 6 and affordability score is 5.5 leading to a portfolio prioritization score for this initiative of 32.5.

Portfolio prioritization scoring model							
Actractivenes	3	Weighting	Contribution			Score	Total
			No	some	high		
Scale of strategic contribution	0.6	0	5	10	10	18	
Confidence in benefits forecast	0.2	0	5	10	5	3	
Stakeholder commitment	0.2	0	5	10	0	0	
Actractivenes score						21	
Achievability	1						
Quality of logical dependency mgt.	0.2	0	5	10	5	1	
Quality of logistical dependency mgt	0.2	0	5	10	5	1	
Quality of risk management	0.4	0	5	10	10	4	
Adequacy of resource provision	0.2	0	5	10	0	0	
Achievability score						6	
Affordability	1						
Capital expenditure	0.5	1	5	10	10	5	
Operational expenditure	0.5	1	5	10	1	0.5	
Affordability score						5.5	
Portfolio prioritization score for initiative X						32.5	

Figure 9: Portfolio prioritization scoring model

Collate all prioritization information and analyze

Now we have our model we can use it to define the priority of all our initiatives. Figure 10 shows for each initiative the priority score based on the previously described portfolio prioritization scoring model. In this example ‘initiative i’ has the highest priority and ‘initiative g’ has the lowest priority.

	Actractivenes	Achievability	Affordability	Score	Priority
Initiative a	21	6	5.5	32.5	2
Initiative b	12	5	5	22	4
Initiative a	15	4	3.5	22.5	3
Initiative d	9	8	3	20	5
Initiative e	6	3	1	10	8
Initiative f	12	5	1.5	18.5	6
Initiative g	3	2	3	8	9
Initiative h	9	5	3	17	7
Initiative i	24	7	7.5	38.5	1

Figure 10: Portfolio prioritization scoring



Figure 11 gives an example of a portfolio map bubble chart, which can be useful to communicate the key findings in a clear and concise manner. In this case the same nine initiatives are shown on the map. The right upper corner is the most favorable one. You directly see the two most important initiatives based on their attractiveness (horizontal line), achievability (vertical line) and affordability (bubble size).

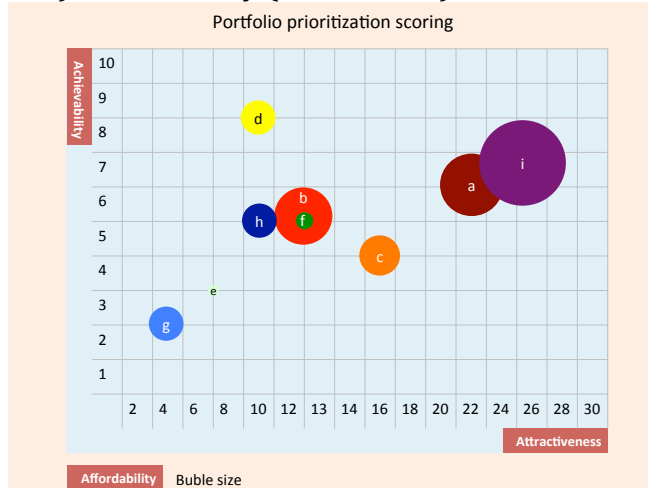


Figure 11: Portfolio map bubble chart of change initiatives based on attractiveness, achievability and affordability

## Keys to successful prioritization

*Tailor the investment criteria:* The model as described in the previous paragraphs needs to be tailored. If you divide your portfolio in different segments, each segment may have its own prioritization scoring model with its own sub-criteria. Make sure every model has criteria under the headings attractiveness, achievability and affordability.

*Involve the management board:* The management board, portfolio board or portfolio governance body must be in the driver seat to decide on the segments, the prioritization criteria and their weightings. They will agree on the final prioritization list of the initiatives within each segment. Usage of techniques like decision-conferencing can be very helpful and effective to reach consensus and gain shared commitment. The objective approach to prioritize will help to make more informed, consistent and transparent decisions, but a model can't replace their management judgement.

*Use multi-criteria analysis:* Utilize criteria under the main headings attractiveness, achievability and affordability to perform an analysis resulting in a prioritized list of initiatives. Keep it simple. There is always the risk of spurious accuracy.

*Use evidence-based assessments:* when filling in the portfolio prioritization scoring model for each initiative, make sure your ratings are evidenced. If possible make use of reference class forecasting. If the data is not available start collecting the data for future usage. In these cases without reference date, the forecasts can be very inaccurate and adjustment for optimism bias could be helpful.

*Be creative in presenting the findings:* Be creative with the way findings are presented. Graphical presentations can be very useful to present key messages in a clear and concise manner. Compare figure 10 and 11 and decide which one is more clear and succinct.



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