

M&IS 34060: Operations Management
Excel Exercises—Factor Rating (Location)

Introduction

This exercise is chosen to test your abilities to design and implement a spreadsheet decision model for factor rating approach that is often used for location problems or for any decision process that is selecting between multiple options and has quantitative and qualitative factors.

Please keep in mind the desirable characteristics for your spreadsheets that we discussed before, such as: formulas being entered once and not requiring change by users, separation of parameters from formulas, breaking down of complex formulas into components, using built in Excel functions instead of creating your own formulas, logical use of rows and columns, etc.

For this exercise, you are to use the function =sumproduct() as needed. You may need to use the help system to figure it out. Also, if time permits, we will explore the =vlookup() and/or =hlookup() functions to see how they could be applied to this situation.

Lab Excel Exercises

(Get the file Location 1 from the files table on the class website, or [click here](#))

Background

Your organization currently uses four different vendors to supply a critical component. This has caused much variability in your quality and complexity in your systems. Because of your track record, you have been selected to lead a team to make a recommendation of a single vendor from which to source.

Your team has decided to use four factors in the vendor evaluation. These include price, quality, reliability, and flexibility. There are several important issues to consider as you implement your decision model.

- 1) You plan to use a ten point rating system where a score of 10 is the best and 1 represents only the minimum criteria is met and is worst. Use only whole numbers for your scores... 1, 2, 3, etc.
 - a. The minimum criteria are: (1) a maximum price of \$480, (2) a maximum defective of 0.5 percent, (3) a maximum of 10 late deliveries out of 1000, and (4) express deliveries are *not* required.
- 2) In implementing this rating system, be sure to maintain precedence relationships (e.g., the best has the highest score, the worst the lowest, and those in between are ordered properly) in the scores.
- 3) The spacing between the 1 – 10 scores should be reflective of the spacing in the original factor values.
- 4) Assign initial weights as: 30 percent for price, 20 percent for quality, 30 percent for reliability, and 20 percent for flexibility.

Assignment

Step One—Silently review this information (approx. 10 min.)

Step Two—Get with 2-3 of your neighbors and discuss how to approach this problem. Specifically consider the issues (1) – (3) above. Develop questions to ask. (approx. 10 – 15 min.)

Step Three—Group Q & A session

Step Four—Implement via Excel with debriefing

Step Five—Consider sensitivity analysis, etc.

	Price (\$/10,000 units)	Quality (defects/10,000 units)	Reliability (# times late per 1,000 deliveries)	Flexibility (express deliveries possible?)
Vendor One	480	20	9	no
Vendor Two	410	35	10	yes
Vendor Three	460	40	5	occasionally
Vendor Four	445	35	6	occasionally

The table above can be found at the class website under the link Location 1 of the computer files.

Factor-rating for Location Analysis

1. Develop list of relevant factors called critical success factors (CSFs).
2. Assign a weight to each factor to reflect its relative importance to company objectives.
3. Develop a scale upon which to score each factor
 - For example, 1-10 (worst to best)
 - Must convert “raw” data to scores
4. Score each location for each factor using the scale from step 3.
5. Find (weighted) average of the ratings for each location.

$$\text{Overall Rating} = \frac{\sum(wgt)(score)}{\sum(wgt)}$$

6. Make a recommendation

Use this information as you complete the EE Location Problem. Please note, these steps are followed in the video but I wanted to make it explicit to you as to why we are proceeding as we are.

Solution Video Links

There are two solution video formats below. The streaming version is interactive and you should try these first for the best experience. If the streaming version does not work for you, use the MP4 version instead.

Streaming Version

[EE Location Part 1—First Half](#)

[EE Location Part 1—Second Half](#)

[EE Location Part 2](#)

MP4 Version

[EE Location Part 1—First Half](#)

[EE Location Part 1—Second Half](#)

[EE Location Part 2](#)