

## Appendix 1 - Example Decision Spreadsheet



This section outlines a simplified method for using a business decision analysis tool to determine if a manual, semi-automatic, or fully automatic tester is suitable for a particular tester design. In such an analysis, each factor involved in a decision is listed in a spreadsheet for ease of analysis. This approach is then used by creating a checklist. If a factor is critical, that factor is given a one. If it isn't, then it is given a zero.

Then the sum of these factors is generated in the spreadsheet. In this example, the result of this sum ranges from 0 to 27. A range of these results is then assigned to determine a requirement of need for a manual, semi-automatic or automatic tester.

The decision-maker usually uses such an approach to improve over a simple "top-of-the-head guess," just using a single top-level gut feeling to choose which of these solutions is best. For such an analysis, the significant factors are taken into account one at a time instead of all at once. An approach like this often produces better results. The approach still involves mainly using a gut feeling judgment on each factor in turn. In the end, a final gut feeling check is used to see if the outcome makes sense.

For this improved approach, a value is given to each factor from say 1 to 3 or even 1 to 10. Finer resolution can add complexity to choosing the value so often. Just 1 to 3 is used. Assignments this would look like:

- 3 = High
- 2 = Med
- 1 = Low

Sometimes, the situation is reversed when the weighting is as follows:

- 1 = High
- 2 = Med
- 3 = Low

For example, for Factor #1, "Experience with Building this type of Tester," this might look like:

- High = Lots of experience with making such testers, say five years at it.
- Med = Some experience with building such testers, say having constructed at least one of them.
- Low = No experience at all with building such a tester

Or, for another example the Factor #7 needs inverted weighting, "Skill level of the Operator" might look like:

- Low = Using a much less skilled person to perform the testing rapidly with a minimum of intervention. (requires a more complex and automatic tester, especially for higher test volumes). Weight = 3
- Med = Using a lower skill level technician, or a person with considerable knowledge of the system (needs some automatic assistance, even if to improve speed and accuracy), weight = 2
- High = Using an Engineer or Advanced Technician to perform the tests (lessens the need for automatic testing). Weight = 1

This type of approach allows general "guesstimates" to be made in a more refined way. One should always see if the overall result makes sense. If not, perhaps some critical factors have been left out.

In the appendix example below, each word Hi, Med, and Low is automatically converted to its weighted number, and then the results are tallied. A high score means that an Automatic Tester should be used in this situation. A low score means that manual testing may be utilized. Manual testing is usually lower cost to design and write test procedures for, and Automatic testers leave judgment out of the situation. It is placed in the test software.

A detailed explanation for using and an Excel Spreadsheet for Calculations are available from APD. Email: [carl@angotti.com](mailto:carl@angotti.com) and request one.

### Example Evaluation Checklist for a Test Equipment Build Decision

<b>Factors</b>	<b>Decision Factors</b>	<b>Value = Hi, Med, Lo</b>	<b>Factor Calculated Value</b>
<b>Factor 1</b>	Experience with Building Similar Testers	Hi	3
<b>Factor 2</b>	Est. Final Cost of UUT	Med	2
<b>Factor 3</b>	Volume Level of Nominal Build	Med	2
<b>Factor 4</b>	Volume Level of Est Life Cycle Build Total	Med	2
<b>Factor 5</b>	Funds Available for Tester Project	Lo	1
<b>Factor 6</b>	Est. Cost to Build Tester and Write software or Test Procedures	Hi	1
<b>Factor 7</b>	Skill Level of Test Operator	Lo	3
<b>Factor 8</b>	Likelihood of Field Failure	Lo	1
<b>Factor 9</b>	Cost of Field Failure	Hi	3
<b>Computed Value of All Factors</b>			<b>18</b>

<b>Computed Value Ranges:</b>		
<b>Max Value</b>	27	<b>Definitely Auto Tester is needed</b>
<b>Mid Value</b>	18	<b>Likely a Semi-Automatic Tester would work.</b>
<b>Min Value</b>	9	<b>Definitely, a Manual Tester is needed</b>