The Systems Thinking Tool Box

Dr Stuart Burge

".. bump, bump, bump, on the back of his head. It is, as far as he knows the only way of coming downstairs, but sometimes he feels that there really is another way, if only he could stop bumping for a moment and think of it."

Winnie the Pooh - A. A. Milne

Decision Matrix and other Evaluation and Selection Tools

What is it and what does it do?

The Systems Approach to problem solving is based upon Divergent and Convergent Thinking where we start be identifying all possible solutions to a problem before evaluating and reducing these to a final solution, as shown in Figure 1.

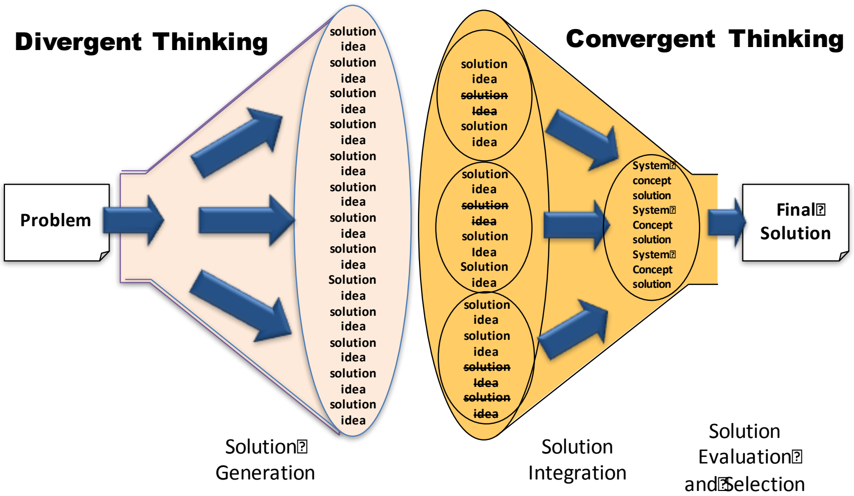

Figure 1: Systems Approach to Problem Solving

Figure 1 has been divided into three distinct stages:

1. **Solution Generation**: This is the Divergent Thinking Phase whereby the emphasis is on generating all possible solution ideas to the problem.
2. **Solution Integration**: This is the first stage of the Convergent Thinking Phase where the weaker solution ideas are removed and the remainder are integrated into a number of candidate whole system concept solutions. This is a consolidation of the various ideas into complete solution propositions

3. **Solution Evaluation and Selection**: This is the final stage, which objectively evaluates the candidate system concept solutions to arrive at the final solution. In practice, we often find that we do not get a clear winner but we can eliminate the weaker candidates. In order to arrive at the final solution further work has to be undertaken.

This third stage is about selecting a solution, it's about decision making:

> **The process of sufficiently reducing uncertainty and doubt about alternatives to allow a reasonable choice to be made from among them.**

This definition stresses the information-gathering/generation aspect of decision making. It should be noted here that uncertainty is *reduced* rather than eliminated. Very few decisions are made with absolute certainty because complete knowledge about all the alternatives is seldom possible. Thus, every decision involves a certain amount of risk.

The tools presented in this guide will help you to make the best decisions possible with the information you have available. They help you work out the importance of individual factors, and choose the best courses of action. They can also help map out the likely consequences of decisions to identify and hence avoid risks. Arriving at the final solution is not easy requiring several iterations, and to do so in an effective and efficient fashion, I use a basic set of four tools:

- N/3 Voting
- Ease-Benefit Matrix
- Paired Comparison (Pairwise Comparison)
- Decision Matrix

Although this Tool Guide is entitled "Decision Matrix", I will describe all four as a useful combination of tools to enable rapid, disciplined and structured decision making.

Why do it?

On one level, decision making is easy, you just decide. Making the "right" decision, however, is not easy because it requires as much information as possible about the decision situation for judgments to be made objectively about a number of decision factors or criteria. It is the fact that many decisions involve multiple "chalk and cheese" factors or criteria that makes the whole process daunting. Decision Making tools help by providing a structured and disciplined approach to taking these multiple factors or criteria into account when reaching a decision

Where and when to use it?

Whenever there is a need to select amongst a number of alternatives when multiple factors or criteria have to be taken into account.

Who does it?

An individual or team can use the various Decision Making tools. In general, the outcome is more rigorous and robust if performed by a team as it will expose and consider multiple views.

How to do it?

Before launching into the specifics of the various tools it is worthwhile talking about the role of context in decision making. Every decision is made within a decision environment. This environment is not static but changes and evolves over time. It will however, comprise the four aspects shown in Figure 2.

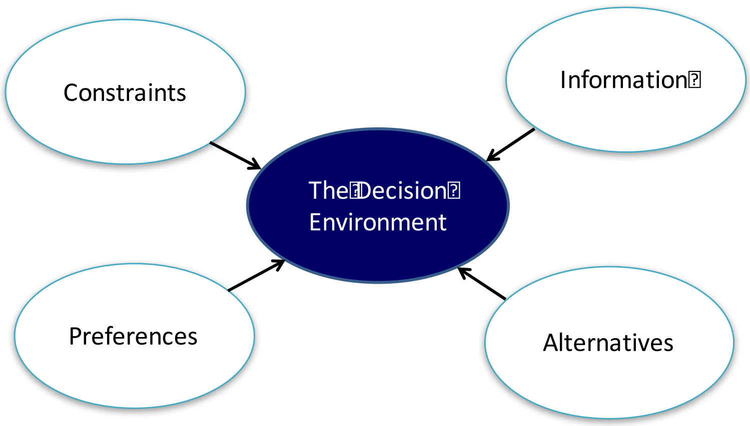

Figure 2: Aspects of the Decision Environment

Constraints: All decisions are made within a set of constraints. These are usually time, cost, effort, resource available, etc. Knowledge of the constraints is important because we use these to eliminate the weaker decision choices.

Preferences: The evaluation criteria of factors that will dictate the preferred course of action. They may be the preferences of the individual or the organization. They may also overlap with the constraints.

Alternatives: The possibilities one has to choose from. Alternatives can be identified (that is, searched for and located) or even developed (created where they did not previously exist). The use of Systems Thinking tools such as Morphological Box and Function Means Analysis is essential here to help generate a fuller set of alternatives as possible.

Information: Knowledge or information about the various alternatives being considered.

The ideal decision environment would include:

- All possible information and all of it accurate.
- Every possible alternative.

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However, both information and alternatives are constrained because of the time and effort to gain information or identify alternatives are limited.

- The time constraint simply means that a decision must be made by a certain time.

- The effort constraint reflects the limits of manpower, money, and priorities. Since decisions must be made within this constrained environment, we can say that the major challenge of decision making is uncertainty, and a major goal of decision analysis is to reduce uncertainty.

We never have all information needed to make a decision with certainty, so most decisions involve an element of amount of risk. Moreover, the fact that decisions must be made within a constrained decision environment suggests two things:

- It explains why hindsight is more accurate and better at making decisions than foresight. As time passes, the decision environment will grow and expand. New information and new alternatives appear, even after a decision must be made. Armed with the new information after the fact, the application of hindsight can make a much better decision than the original.

- As time passes, the decision environment continues to expand with more information and choices, therefore it follows that it is advisable to put off making a decision until close to the deadline. However, since we are dealing with reality, delaying a decision may mean that some alternatives might no longer be available

In this guide, the tools are presented are in the order they are typically used, starting with N/3 Voting, through Ease-Benefit Matrix to Paired Comparison and culminating in the Decision Matrix. The tools are increasingly more sophisticated and therefore time consuming and the overall approach is one of eliminating the weaker options to final select between a number of viable candidates. In this guide, it is assumed that stages 1 and 2 of Figure 1 have been successfully completed, using tools like Morphological Box or Function Means Analysis, and our task is to evaluate the remaining options to arrive at final decision.

N/3 Voting

N/3 Voting is a very simple tool that can be used to help a team deicide amongst a number of options. It is particularly useful to quickly reduce a large list of options down to a reasonable number where more sophisticated decision making tools such as Paired Comparison and/or Decision Matrix can be used.

The N/3 Voting is a simple process where given 'N' options to select from:

- Allocate each member of the team N/3 votes.
- The various options are described to the team and members are given several minutes to think about the options and where they would like to place their votes.

- Team members place their votes on the options.
- The option with the most votes is the "winner"! In practice if this was to happen, I would be very worried. I would expect some options to be clear "losers", there may well be a numeric winner, but there are likely to be options that are very close and therefore can we decide based on what might be subjective decisions.

Consider the situation where there are 12 possible options, A through to L. Each member of the team will be allocated 12/3 = 4 votes. How they place the votes is often a point of debate. Can a member put all their votes on one option? My advice here is to be flexible. If people ask what the rules are, discuss the possible scenarios with them and let them agree their own. In this example, team members were allowed to place votes wherever they likely – all four if they desired.

A👍👍👍👍👍👍

B👍👍👍

C👍👍👍

D

E👍👍

F

G

H👍👍👍👍

I👍

J

K

L👍

> The winner is A, but H is very close and should not be ignored – but then what about C and B?
>
> Typically N/3 is used to reduce the options down to more manageable number and we have to use another tools to decide

What Goes Wrong: The limitations of N/3 Voting

N/3 Voting goes "wrong' for two reasons:

- Team members don't understand the option choices because they are not adequately defined or described. In such situations, individuals will make assumptions to allow themselves make choices. The issue can be tackled in two ways:
    - Put the effort into describing each option
    - Reviewing the selected items afterwards to confirm that the team members have selected what they think they have selected

- Team members being biased by other team member's decisions. Because the voting is normally done "in turn", the latter votes are affected by what has gone before. This can be overcome by providing each team member with a "voting slip" on which to place their votes. These can be collected and the final results announced

Ease-Benefit Matrix

The Ease-Benefit Matrix is a useful alternative to N/3 Voting to "trim-down" a large number options. Often useful in evaluating situations where several solutions may be adopted. This is typical of improvement activities in process-intensive systems where some solutions have a significant benefit but are extremely difficult to implement, whereas others offer less benefits, but are easier to do. Figure 3, shows an example Ease Benefit Matrix for a number of alternative improvement ideas (obtained using a Soft Systems approach) for my company's marketing system. The various improvement ideas are given in Table 1.

In this particular example, of an Ease Benefit Matrix, the size of the circles indicates the amount or resources required to implement the improvement ideas. The larger the circle the more resources deemed necessary. So for example, the 3-circle is saying we have an idea for change (Agree a standard format for marketing material and develop materials for all current products and services) that has a high benefit, is relatively easy to do but will require significant resources to complete.

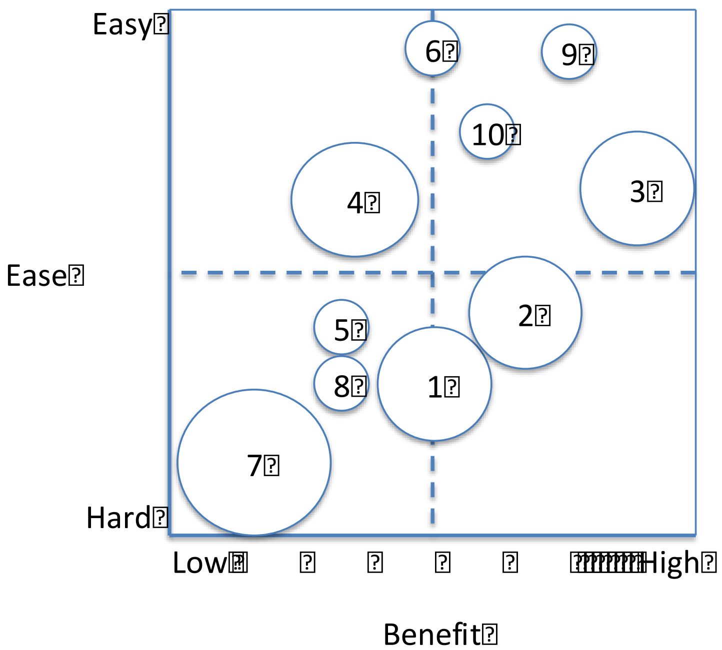

Figure 3: Ease Benefit Matrix for Improvement Ideas to the BHW Marketing System

BURGE HUGHES WALSH

What could we do: Improvement Ideas	
1.	Design develop and implement a more systematic approach.
2.	Establish a formal review process with in each business area and across the company as a whole.
3.	Agree a standard format for marketing material and develop materials for all current products and services.
4.	Establish business area planning for new products and services.
5.	Seek advice and guidance on how to define and agree our unique competitive advantage.
6.	Do not bother – if our products and services are okay clients will come
	OR
7.	Undertake a detail competition assessment exercise.
8.	Perhaps need guidance on what is possible.
9.	Make this element a formal item on the Meeting Agenda.
10.	Use the Marketing meeting actions to drive the control action.

Table 1: List of Improvement Ideas for the BHW Marketing System Generated from a Soft Systems Approach

In this particular situation, there was no single solution but a recognition that all the ideas in Table 1 would be of benefit, but neither the resource or finding was available. Moreover, it was considered to do something quickly. In this case the Ease Benefit Matrix was used to identify the vital few that were quick to implement, with little resources. In this case 9, 10 and 3[1].

What Goes Wrong: The limitations of Ease-Benefit Matrix

The Ease-Benefit goes "wrong' because of the limited number of, and crude nature of the decision scales. Although more objective than N/3 Voting, because of its multi-faceted nature, the Ease Benefit Matrix lends itself to problem types where several ideas are likely to be pursued, rather than a tool to identify "the winner".

Paired Comparison

Paired Comparison can be used when we wish to select from a group of seven – four options. If there are more than seven, then N/3 is recommended, if there are four or less options the Decision Matrix is recommended.

[1] As an aside here the major effort was expended on idea 3 for which a number of standardised "flyers" for training courses were created within a few days. Those particular items have led to numerous opportunities.

In its simplest form, the Paired Comparison process is:

- Each option is compared, as a pair, with every other option.
- For each pair**,** the team decides which is the best of the two.
- The solution option with the most wins is selected.

Again, the best method to help explain the process is by example. Figure 4 shows the follow-on example from the N/3 situation:

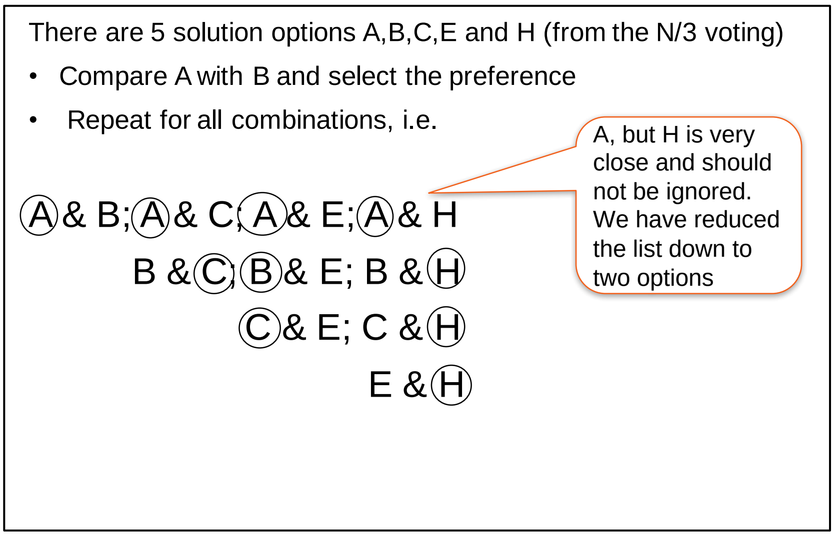

Figure 4: The Paired Comparison Process

A more rigorous version of Paired Comparison, sometimes called Pairwise Comparison to distinguish it, uses a scale based on *absolute judgements.*

Judgements are the ability to make considered decisions or come to sensible conclusions that can take several forms:

a. The mental ability to perceive and distinguish relationships*. For example; tiredness may affect a driver's judgment of speed*

b. The ability to form an opinion by distinguishing and evaluating*. For example; he felt that this gig was better than the band's last one at this venue because the sound quality was superior.*

c. The capacity to assess situations or circumstances and draw sound conclusions. *For example; given the time of day, and the distance we have walked, I propose a taxi home would be sensible.*

Judgments, however, come in two basic forms: absolute and relative.

An *absolute judgment* is where it is possible to identify the magnitude of something – for instance, the loudness of a sound or the size of a space. Such judgments are usually in terms of standards in memory about similar "things". For example, this restaurant is half the size as the one in Manchester, this car is 25% more expensive than that one.

A *relative judgment* is the identification of some relation between two “things” that are both present to the observer-judge. For example, that shirt is “bluer” than that one, you are taller than your friend.

Decision making tools like Paired Comparisons rely on our ability to make relative judgments, and actually, we are rather good at it. Given two choices and a decision criterion we can usually pick the “winner”. Decision tools based on using relative judgments unfortunately suffer from inconsistency, particularly where the decision involves several criteria, which is the everyday reality we all face. Inconsistency can be described as:

- A is twice as good as B
- B is twice as good as C
- C is twice as good as A

Clearly if we were consistent, A would be four-times as good as C. Unwittingly, when making decisions that involve several criteria we are frequently inconsistent despite our good intentions.

The beauty of Pairwise Comparison is that it gets us to use absolute judgments, which in turn enables us to examine consistent we have been. Consistency is necessary but not sufficient condition in decision-making and therefore presents a superior approach over other decision-making approaches. Table 2 shows an example of the output from a Pairwise Comparison.

Alternatives	Importance
A	0.22
B	0.12
C	0.54
D	0.12
	1.00

Table 2: Example Output of a Pairwise Comparison

The output – the Importance column is a *normalised* ranking of options. This normalisation means that Option C is more than twice as important than its nearest rival, option A.

Performing a Pairwise Comparison is a four-step process as shown in Figure 5.

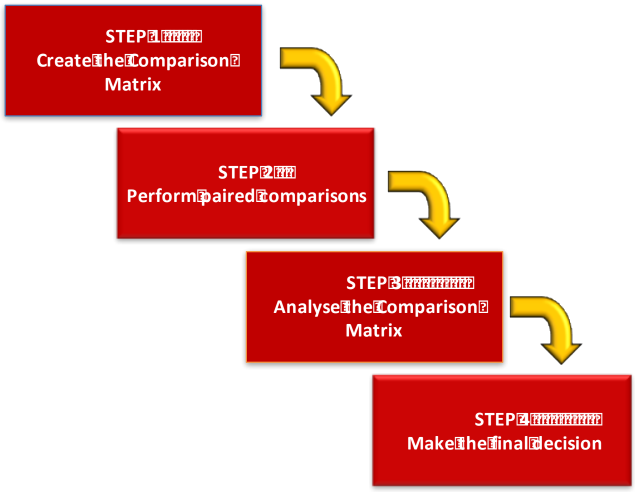

Figure 5: The 4-Step Pairwise Comparison Process

The best way to explain this process is by a simple example where there are four alternative options A to D.

Step 1: Create the Comparison Matrix

	A	B	C	D
A	1			
B		1		
C			1	
D				1

The shaded cells are the reciprocals of the comparison captured in the white cells.

The 1's indicate that A is the same as A etc

Step 2: Assess each alternative against the others through a series of pairwise comparisons. Here we use the Saaty scale shown in table 3 to capture how much more preferred one option is over the other.

The Saaty Scale	
Equally preferred	1
	2
Weakly Preferred	3
	4
Strongly Preferred	5
	6
Very Strongly Preferred	7
	8
Absolutely Preferred	9

Table 3: The Saaty Scale for Pairwise comparisons

The comparison is always done row against column

	A	B	C	D
A	1	2	1/3	
B		1		
C			1	
D				1

The 2 in the second column is capturing that the team weakly prefer A over B.

The 1/3 in the third column captures that the team prefer option C to A and consider options C to be weakly preferred

We complete the Comparison Matrix by computing the reciprocals to fill in the lower triangle of the matrix.

	A	B	C	D
A	1	2	1/3	5
B		1	1/7	4
C			1	9
D				1

	A	B	C	D
A	1	2	1/3	5
B	1/2	1	1/7	4
C	3	7	1	9
D	1/5	1/4	1/9	1

Step 3: Analyse the Comparison Matrix

Having completed the Comparison Matrix we perform some mathematics[2]. What is shown here is an approximate method, and provided the number of options is 7 or less it is generally very good. For example the exact importance of A, B, C and D is 21.74%, 12.18%, 61.51% and 4.57% respectively.

The mathematics begins by calculating the row product.

For example, the row product for option A would be 1 x 2 x 0.33 x 5 = 3.33

	A	B	C	D	ROW PRODUCT
A	1	2	0.33	5	3.33
B	0.5	1	0.14	4	0.29
C	3	7	1	9	189.00
D	0.2	0.25	0.11	1	0.01

[2] For those of you wanting know what going on here we are the determining the Eigen structure of the Comparison Matrix by an approximate method. The Comparison Matrix will have 4 eigenvalues (4, 0, 0, 0) and the eigenvector associated with the non-zero eigenvector is the importance values we seek.

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Then take the nth root for the row product. "n" is the number of options being evaluated – in this case 4.

For example, for option A, the 4th root of 3.33 is 1.35.

	A	B	C	D	ROW PRODUCT	nTH ROOT OF ROW PRODUCT
A	**1**	**2**	**0.33**	**5**	**3.33**	**1.35**
B	**0.5**	**1**	**0.14**	**4**	**0.29**	**0.73**
C	**3**	**7**	**1**	**9**	**189.00**	**3.71**
D	**0.2**	**0.25**	**0.11**	**1**	**0.01**	**0.27**
						6.06

Add up all the nth roots

The final step is to divide each of the nth roots by the sum of all the nth roots.

	A	B	C	D	ROW PRODUCT	nTH ROOT OF ROW PRODUCT	NORMALISED SO VALUES ADD TO 1
A	1	2	0.33	5	3.33	1.35	**0.22**
B	0.5	1	0.14	4	0.29	0.73	**0.12**
C	3	7	1	9	189.00	3.71	**0.61**
D	0.2	0.25	0.11	1	0.01	0.27	**0.05**
						6.06	**1.00**

These are the Importance's

This normalisation of the score to provide a set of weights (importance's) that sum to 1. This allows a direct comparison of the alternatives on a more intuitive scale. This final column has one more "trick" it is a true ratio scale, which allows us to concluded that option C is nearly 3 times more preferable than option A.

What Goes Wrong: The limitations of Paired Comparison

Paired Comparison also goes "wrong' for two reasons:

- Team members do not understand the option choices because they are not adequately defined or described. In such situations, individuals will make assumptions to allow themselves make choices. The issue can be tackled in two ways:
    - Put the effort into describing each option
    - Reviewing the selected items afterwards to confirm that the team members have selected what they think they have selected

- Inconsistency of judgments: Paired Comparisons relies on our ability to make relative judgments. Given two choices and a decision criterion we can usually pick the winner. Decision tools based on using relative judgments unfortunately suffer from inconsistency, particularly where the decision involves several criteria – which of course is the everyday reality we all face. Inconsistency can be described as:

  - A is better than B
  - B is better than C
  - C is better than A.

  Unwittingly, when making decisions that involve several criteria we are frequently inconsistent despite our good intentions. If there are not too many options, it possible to "test' the paired choices for inconsistency. For example, in Figure 2:

  - C is better than B
  - B is better than E
  - C is better than E.

  Which is consistent.

Decision Matrix

The Decision Matrix is one of the most commonly decision/evaluation tool. It the most sophisticated of the tools presented in this guide as a consequence of using pre-determined evaluation/selection criteria to assist in the process. There are several formats but all involve evaluating the options against a number of criteria. Recognising that the evaluation criteria are not all equal, they are typically weighted.

Figure 6 below shows Decision Matrix used to evaluate and select a supermarket.

Supermarket Example	price of goods,	variety of goods,	parking,	distance	staff attitude	TOTAL
weighting	0.3	0.2	0.1	0.1	0.3	
Tesco	70%	70%	90%	60%	70%	
score	21%	14%	9%	6%	21%	(71%)
Waitrose	60%	90%	80%	50%	90%	
score	18%	18%	8%	5%	27%	(76%)
Budgens	50%	60%	70%	90%	30%	
score	15%	12%	7%	9%	9%	(52%)

Figure 6: Decision Matrix to Evaluate and Select a Supermarket

In Figure 6, the scenario is one of deciding amongst three candidate Supermarkets: Tesco, Waitrose and Budgens. Each has its merits and therefore it is not a straightforward decision. This is a common situation where there are multiple factors, some of which are quantitative, whilst other qualitative.

The process for using a Decision Matrix is shown in Figure 7.

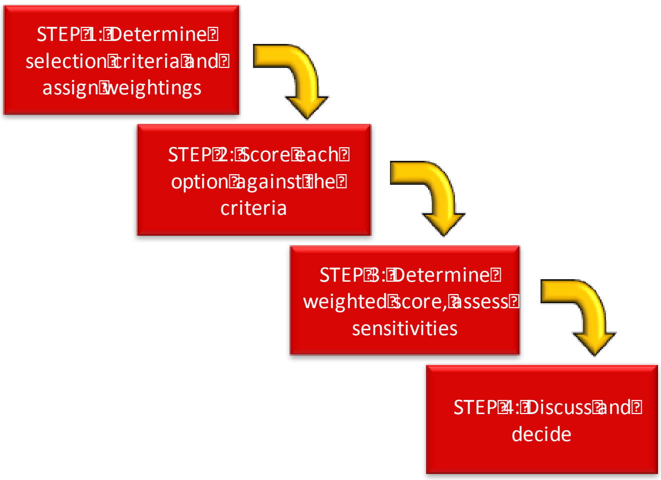

Figure 7: The Process for Using a Decision Matrix

Step 1: Determine the Selection Criteria and Assign Weightings: This step is concerned with determining a set of criteria for the evaluation/decision. They do not have to be quantitative but they do have to relevant to the decision. Indeed, it is important to be clear, when using a Decision Matrix, what the actual decision is! It is also important not to have too many criteria, or too few. As a simple rule of thumb, I aim for 4 to 7 criteria.

Have agreed a set of criteria, they should be weighted. The most common way of doing this is to give each one a weighting such that the sum of all the criteria weightings = 1.0. This will result is the final weighted scores being on a percentage score between 0% and 100%.

In the case of the Supermarket decision, the criteria identified were:

- Average price of goods
- Variety of goods
- Ease of parking
- Distance from home
- Staff attitude.

Note that some are quantitative (price of goods and distance from home), whilst the others are qualitative (Variety of goods, Ease of parking and Staff attitude). These criteria were then weighted:

Criteria	Weighting
Average price of goods	0.3
Variety of goods	0.2
Ease of parking	0.1
Distance from home	0.1
Staff attitude	0.3

Step 2: Score Each Option Against each Criteria: Using the previously defined and agreed criteria, each decision option is scored using table 3

Rating	Description
100	Complete satisfaction: Criteria satisfied in every respect
90	Extensive satisfaction: Criteria satisfying in all important aspects
70	Considerable Satisfaction: Criteria satisfied in the majority of aspects
50	Moderate satisfaction: A middle point between complete and no satisfaction
20	Minor satisfaction: Criteria satisfied in some but less than half the aspects
10	Minimal satisfaction: Criteria satisfied to a small extent
0	No satisfaction; Criteria not satisfied at all

Table 4: Decision Matrix scoring

Note that the scale has a resolution of 10% and it's therefore important to note that the percentage score is a subjective assessment made by the team and is subject to a degree of uncertainty.

Returning to the Supermarket example, the table for the option score is given in Figure 8.

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Supermarket Example	price of goods,	variety of goods,	parking,	distance	staff attitude	TOTAL
weighting	0.3	0.2	0.1	0.1	0.3	
Tesco	70%	70%	90%	60%	70%	
Waitrose	60%	90%	80%	50%	90%	
Budgens	50%	60%	70%	90%	30%	

Figure 8: The Supermarket Option Scores

In Figure 8, Tesco's scores 70% for "price of good". 100% would be the lowest "price of goods", Tesco is cheap, but not the cheapest in the UK. Waitrose scores 60% for this factor because on average its prices are higher than Tesco's. Lastly, Budgens scores 50% because it is the most expensive.

It is good practice when using a Decision Matrix to record why a particular score was given. Clearly the Decision Matrix is a tool that can be automated via a spreadsheet. In such cases the use of "notes" to capture any debate over scoring is a very good discipline.

Step 3: Determine Weighed Score: This step is very automated, it is about multiplying the option score with the weighting to give the weighted score so that each option has a total score. This is shown in Figure 9 for the Supermarket selection example. In this example the **weighted score** for Tesco's on "price of goods" is simply 70%x0.3 = 21%. In a similar fashion the weighted score for "variety of goods" is 70%x0.2 = 14%. By summing all the weighted score, we arrive at the final weight total for Tesco as 71%.

Supermarket Example	price of goods,	variety of goods,	parking,	distance	staff attitude	TOTAL
weighting	0.3	0.2	0.1	0.1	0.3	
Tesco	70%	70%	90%	60%	70%	
score	21%	14%	9%	6%	21%	(71%)
Waitrose	60%	90%	80%	50%	90%	
score	18%	18%	8%	5%	27%	(76%)
Budgens	50%	60%	70%	90%	30%	
score	15%	12%	7%	9%	9%	(52%)

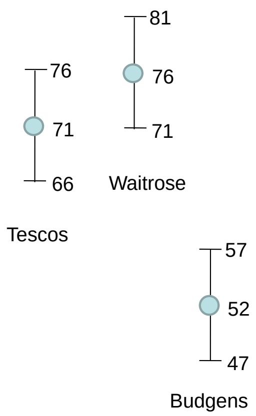
Figure 9: The Supermarket Weighted Scores

Step 4: Discuss and Decide: This is the critical step where have done the evaluation we have to decide, or not. Consider the Supermarket example shown in Figure 9. There is a numerical winner, Waitrose comes out on top with a total weighted score of 76%. Tesco's is second with 71% and Budgens is last with 52%. But does this mean we should select Waitrose? It is important to note that the percentage score is a subjective assessment made by the team and is subject to a degree of uncertainty. For instance, we said that Tesco's scored 70% with respect to price of goods but what if we had said 65% or 75%? Would that change the final ranking? What about the uncertainty in the other scores? Figure 10 shows a sensitivity analysis for the Tesco's row where we have gone 5% either side of the given score.

		0.3	0.2	0.1	0.1	0.3	
Tesco	Low	65%	65%	85%	55%	65%	
	Best	70%	70%	90%	60%	70%	
	High	75%	75%	95%	65%	75%	
	Low	20%	13%	9%	6%	20%	66%
	Best	21%	14%	9%	6%	21%	71%
	High	23%	15%	10%	7%	23%	76%

Figure 10: Sensitivity Analysis for the Tesco's Row

The bottom right hand corner gives range of the total weighted score when the individual criteria scores are flexed by 5%. If this is repeated for the other choices, we arrive the representation shown in Figure 11.



Testing the sensitivity of our subjective assessments can help us draw the right conclusions.

In this case we could not confidently separate Tesco from Waitrose but we could confidently eliminate Budgens.

In simple terms, Figure 11 is telling us that we do not have enough information to be able to decide between Waitrose or Tesco. We can still decide, it is easy, just choose one, but we have no argument to back up out decision.

Figure 11: Weight Score sensitivity

In order to decide we will have to generate further evidence by possibly looking at other factors.

What Goes Wrong: The limitations of the Decision Matrix

The decision matrix is a very powerful tool because it adds structure to our decision making. It is, however, not without it issues and limitations: that include:

- Too few or too many selection/evaluation criteria. Always aim for 5 to 7 criteria.
- Objective subjectivity! It is possible to select criteria, weightings and scores to obtain any result. It is vitally important that care is taken in arriving at the section criteria. Furthermore, they are clearly defined so the deciding team is in agreement as what each means. It is also important to clearly state and calibrate the scoring scale.
- Often no clear winner, especially is a sensitivity analysis is undertaken. The decision matrix will, however, often lead to the elimination of weaker options.

- Can be treated as a "handle turning" process without thinking. There will always be a numerical winner (a draw is possible), but if it is the winner the team should be consensus and be able to construct a clear argument as to why it was selected.

Success Criteria

While I have spoken about the limitations of each Decision Making tool because they are different, the success factors are remarkably consistent.

- All the Decision Making tools presented demand a workshop type session that must be led. That leader should lead the session with a focus on clarity of:
  - Purpose
  - Process
  - Output
- Group/team size between five and eight. I am often confronted with groups or teams of 20 plus people, usually because people feel they have to invite all the stakeholders. In such situations, the only recourse is to split the assembled mass in to smaller groups, each with the same task. This will mean coalescing the different outputs into a single outcome.
- Use an experienced independent facilitator, particularly when attempting to combine individuals' efforts.
- Take time to define and explain the purpose of the session and situation under investigation. There are always two aspects to a decision session – the what (we are looking at) and the why (we are doing it).
- Explain clearly the process of the tool you want to use and if possible provide an example of the "sort of" output you are looking for. You could be accused of "leading the witness" here. I always own up to it explaining that I am simply providing an example (that may be wrong!)
- If there are a large number of candidate options, consider using N/3 and Paired comparison to reduce the number down 2 or 3 for which a Decision Matrix can be used.

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