

ACHIEVED

# Models & Decision Making

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# Introduction

I have been asked to create a presentation for the business Playhouse Spreadsheets, which will provide information about the Decision Making process for spreadsheets. Playhouse spreadsheets do not have a background in spreadsheets, and need a guide on how to present and model their data and forecasts.

Playhouse Spreadsheets create spreadsheet solutions for colleges and sixth forms in the United Kingdom which help with their productions.

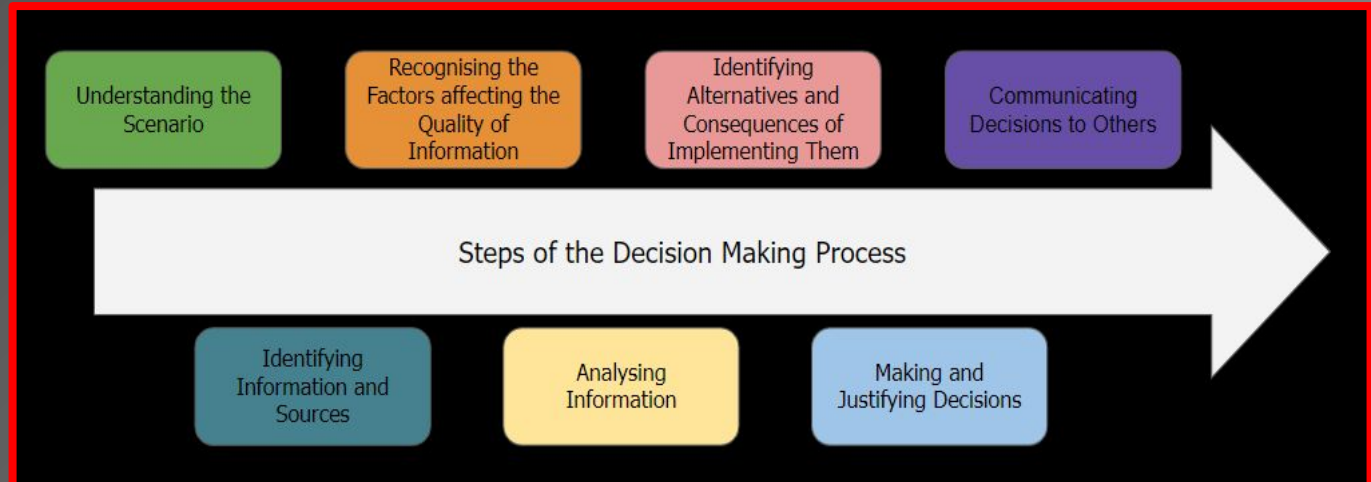
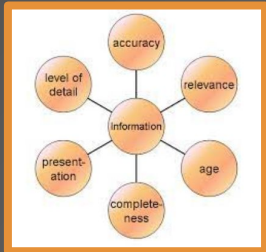
I will be creating this powerpoint to show how the stages of decision making can be used in this occasion to create a spreadsheet which will be able to predict the forecast for ticket sales, and overall profits made during the time which the tickets for productions are on sale.

This information will also need to be presented to Playhouse Spreadsheets as they will be able to understand how the seven stage model can be used effectively.



# Stages of the Decision Making Process

There are 7 stages in the Decision Making process which allow for effectiveness and efficiency to be achieved successfully.



# Understanding the Scenario

Understanding the Scenario is a very important stage making process.

Having a Scenario is important as it means you can piece important information about a given situation together. This could be information about the inputs needed for the spreadsheets, or for the expected results from the user, as the spreadsheet must match user needs.

Including the outcomes in the scenario building is necessary to paint a full picture, if you only know the inputs of the scenario, you would not be able to find the outputs necessary. Without an output, the users will not be able to have their needs met as we could not work towards producing those outputs.

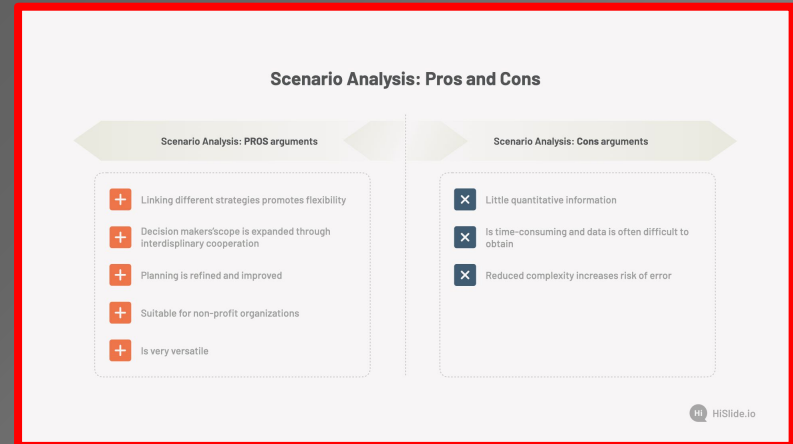
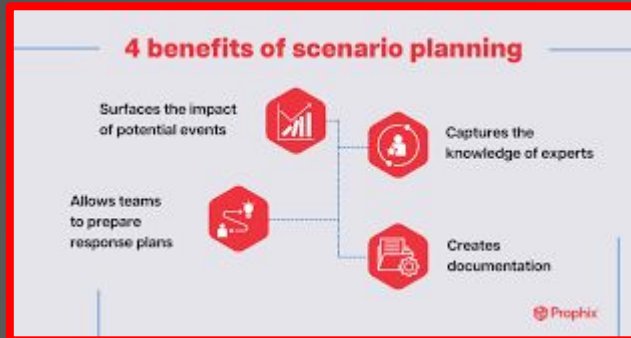
For example, if a grocery store business needs a spreadsheet to be made which will take the stock amounts and prices of grocery items, and to display the total price of each stock amount. This scenario would require understanding in order to provide the desired outcomes for the business.



# Pros and Cons of Understanding the Scenario

If you can understand the scenario successfully, then many advantages may present themselves. Meeting targets and deadlines may become easier. This could also help with dealing with a budget, as you can realise which pieces of the scenario will require budgets to be used.

However, if you are to understand the scenario unsuccessfully, then time and materials could be wasted. If deadlines are in place then this time could have been used more efficiently. This could also lead to money being wasted, which could lead to the budget of the overall scenario being wasted on unnecessary purchases of information.



# Identifying Information and Sources

Identifying Information and Sources is primarily focused on gathering data which can be used in the scenario that you have recently understood and analysed.

This information could already be present and provided by the business in which you are working for, this is classed as internal information. This information could also be external information which means that it must be collected outside of the scenario. This data might need to be purchased which can use some of the allocated budget for the company.

IDENTIFYING  
POTENTIAL  
SOURCES OF  
INFORMATION



These sources of information must also be reliable. For example, information which has sourced by small companies with a smaller reputation may be harder to see as reliable due to the fact that not many people use the information already.

If the information was sourced by a larger company with a much larger reputation, or was ran by a job role which is important then it will be seen as much more reliable and credible.



# Examples of Identifying Information and Sources

External information sources could include:

Census surveys

Qualified demographic reports

This information will have to be checked to ensure that the data

Internal information sources could include:

scenario business already has information that needs to be spreadsheet. This info can be used instead of external and also links back to what the user needs

Some examples of data requirements which need to be met in identifying information include the GDPR (General Data Protection Regulation) which regulates the data which can be harvested from users, and the data must also be kept secured and encrypted to keep the data away from people who can intercept this data.





# Recognising the Factors Affecting the Quality of Information

There are many factors which will affect the quality of the information which is being sourced.

**Currency** is a main factor which affects the quality of this information. **Currency** is timebase of a source. The more recent information has been published, the more current the information is. **Currency** is a factor which is purely based off of recency. This is important, as if the data you collect is current, then it is worth more as this means that the information is accurate to the timebase we are in.

**Accuracy of Data** is necessary when needing to ensure that the reliability of information is high enough to be used in the given scenarios.

If data is not accurate, there may be misunderstandings with the data. For example, if data about age demographics is not accurate, then a business may cater to the wrong audience.





# External Factors Affecting the Quality of Information

External Factors can also be present which may affect the Quality of the sourced Information, these effects can be either positive or negative.

Politics can affect an audience in many ways, which can then also sway votes in information. This is as politics have a large influence on the wider audience.

Social Trends also may have a large impact on the quality of information, as social trends usually increase information numbers for a short period of time and then flatten out.

Economics may affect this quality of information. For example, if a product costs too much, then not as many people will buy the items due to this economic aspect. This will lower the quality of the information

For example, a pandemic such as covid-19 affected many different ways in which information can be gathered, and a drop in the quality of information was noticed.



# Analysing Information

Analysing Information is the use of turning 'Raw Data' into readable information through the use of software.



The software which is used is primarily spreadsheet software. This software can be demonstrated in a flat form and has easy to use functions which can be used to display this data in a much more manageable format. Spreadsheet software also utilises macros. For example, if a company wants to find out a total amount of sales, they can use the SUM function to calculate this amount.



## ANALYSIS

Being able to analyse data in different formats allows the information which is being presented to be put in ways which the scenarios ask for. If specific functions are called for, this will help with the overall displaying of 'Raw Data'.

# Identifying Alternatives and the Consequences of Implementing Them

When identifying alternatives, you primarily focus on if you would be able to find better paths when dealing with a scenario. For example, this could be asking better questions when sourcing information.

In a business environment / aspect, taking alternative routes may provide benefits. Having different options allows for the scenario to be managed from different perspectives.

Using spreadsheet software allows for different alternative routes to be taken as many sheets in one file can be made, and this allows for the data to be managed separately from any other alternative sets of sourced information.

However, identifying alternatives can be difficult if the scenario itself does not give enough information which can be tackled from many different angles. If you identify an alternative route and it doesn't manage to work, then this could be a waste of time and money, and the business itself may only want a simple route to be taken.



## Identifying Alternatives and the **Consequences of Implementing Them**

Consequences may be present if you are to identify alternatives which may not be needed.

If you identify an alternative, you need to ensure that the correct results will show, and to ensure that you are still using the correct input and output data which the scenario is asking for.

However, when identifying alternatives you should not make too many as creating multiple alternatives will use more money and time, and could reduce the overall time that you have to fully complete the spreadsheets.

If you are using different charts, you also need to ensure that they will still present the same results, and to keep all the data labeled clearly to mitigate confusion or misinterpretation.



# Making and Justifying Decisions

You will always need to justify the decisions you have made to stick to a scenario, especially if you have chosen to take an alternative course of action.



Your choices of information matter and you will need to justify this. For example, if you chose information which was from a source with a lower reputation, why did you make this decision. If you chose information that was purchasable, you must explain why this choice was made (Was the quality of information better than others?)

When it comes to making decisions, the information which you have been given in the scenario will help. This is because the specific information which you need to source will be stated to you, this gives you a set path on how to deal with the scenario on a baseline, from here you can then also identify alternatives and then justify these extra choices.

# Communicating Decisions to Others

Everyone who is involved in the decision making process will need to be updated on all decisions made during the creation of the spreadsheets.

There are many different methods in which communication can be kept with businesses. Some of these include: Telephone, Video / Audio Conferences, Emails and Face to Face meetings. These different methods of communication allow for this to be kept up throughout the decision making process, and ensures that no mistakes that are to do with communication are made.

You will have to know the importance of the information that is being shared, and the people who are involved with the communication.



# Methods of Communication

**Telephone calls** are a fast way of communication, and can be easily scheduled as they do not require any of the people involved to commute to buildings, like they would have to if it were a face to face meeting.

However, these calls don't allow for the same level of communication as cannot have the capability to see each other in the meetings, and on telephone calls, images to support their meeting cannot be used and this may be worse at getting across the ideas which you are meaning to communicate.

For example, some job interviews are done through telephone calls, as they can be done quickly without anyone having to commute, especially if the employers are based outside of your commutable distance.





# Methods of Communication

**Video and Audio conferences** are a better plan when it comes to having a meeting which is not face to face. These conferences usually have more than two people in and consist of lots of different ideas. In these conferences, you will be able to present ideas and alternatives to the people you are working with, and backup all of your ideas with relevant stats or images.

However, compared to other methods such as face to face meetings, these are not as good to take part in as the audience in which you are presenting to are harder to communicate with as there may be technical difficulties, such as audio issues or video issues, which may be a dampener on the quality of the meeting.



For example, most business idea meetings will be on conferences online as can be held remotely and images and videos can be shown to backup the ideas which are being presented.

# Methods of Communication

Emails are another way of communicating through the internet, these are primarily used for communication over distances where users can show and share their sheets or presentations.

These are easier for most people as it does not require any verbal communication through audio, yet all communication can be done over a span of time, which allows developments to be made and for all parties to be updated constantly.

However, as this is through email, the times in which it will take to gain a reply might be longer than that over any other method of communication, and some email applications have limits on file sizes, meaning if a spreadsheet is too large, it cannot be sent through that method.



For example, if you are going through the steps of the decision making process for a scenario which is based around finance, the users and the developer can transfer data and keep each other updated through emails, which do not need to be responded to instantly, if there is more data which needs to be sent

# Methods of Communication

Face to Face Meetings are the most professional way to discuss ideas among peers.



These provide the most efficiency as discussion is key during face to face meetings. Presentations can be shown, and these ideas can also be developed on with the help of the users / clients and their scenario. During these meetings you can also gain a better understanding of the scenario as a whole, and these meetings can be kept up quite often to stay ahead of the task.

However, these meetings require commuting, and if the business is far away this may be difficult to meet.

For example, a business meeting may be held at the main HQ for a business, and this will hold a lot of people such as stakeholders who will be interested in the ideas which are being presented.

# Spreadsheet Features used to Support Data Modelling

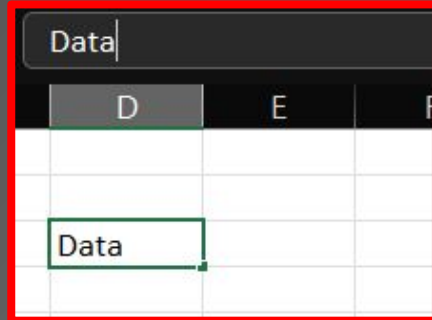
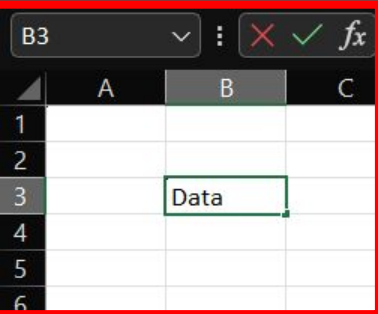
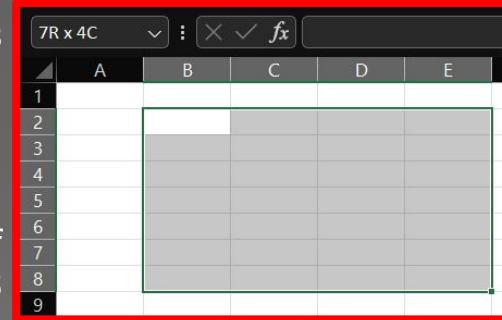
# Entering and Editing Data

Entering and Editing Data consists of lots of parts which make up the basics of spreadsheet software.

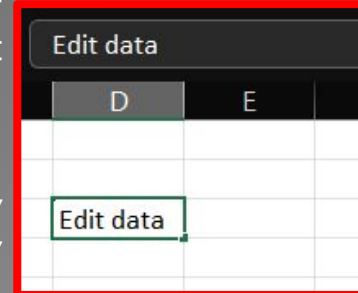
When entering data, there are two main ways of doing this. One instance of entering data can be through double clicking on a cell and then typing in data. Another way of entering data may be through entering the text directly into the formula bar, where it will show up in the cell in real time.

However, Text may overflow and then cell formatting is needed to increase the size of the cell.

Cell references are the locations of a cell or the range of a cell. This reference can be used in formulas which will be used throughout the spreadsheets. Here, I selected the range of cells from B2:F8



Editing data is just as simple as entering the data to begin with. Using the cursor you can select where you want to start editing data, and delete, select or add more information. The cell with the data in will update and the edits will be saved. Here, I selected before the word 'Data' and edited it by adding the word 'Edit' beforehand.



# Benefits and Negatives of Entering and Editing Data

There are benefits and negatives of either importing raw data from online, or through adding data in manually and directly.

Adding data directly can be good as the data can be set up in columns and rows in the way you need it to be, without the hassle of changing all of the data around to fit the requirements you need. However, this data will need to be formatted, and importing a raw data set can already sometimes be formatted to save time and to keep efficiency.

Importing raw data sets into a spreadsheet is a good way to get a large set of data which removes the tedium of entering data directly. This data is usually from reliable sources which is a benefit due to the process of gathering primary data being eliminated by having third party information. However, this data may not be set up and customised to how you want it to be, so some formatting changed might need to be changed.

Player	Minutes	Points	Rebounds	Assists
A	39	20	6	5
B	30	29	7	6
C	22	7	7	2
D	26	three	3	9
E	20	19	8	2
F	9	6	14	14
G	14	12	8	3
I	22	33	?	5
J	34	8	1	3
K	1		4	

An example of 'Raw Data'

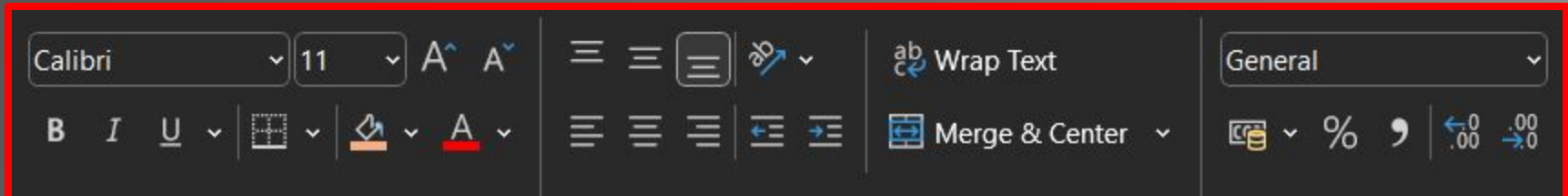
# Formatting Data

O	P	Q	R	S	T
	Data	Data	Data	<u>Data</u>	

Formatting data can be done in many different ways, toolbar at the top of the spreadsheet software, known as the ribbon, houses many different tools which can be used for formatting such as Text / Font formatting. This formatting can involve changing data to a currency format, which allows for functions to be used and to provide an output as a currency such as £ or \$.

Data formatting such as conditional formatting can be used to change the colours of data sets if they are over or under a certain value. The colours of this conditional formatting can be changed to allow for even more representation of values or data. Conditional Formatting makes specific cells easier to identify through the use of applying formatting properties.

These can be used for data analysis as it allows for data to be represented in ways which can show positives and negatives such as profits or losses in a business aspect or finance aspect.





# Using Formulae and Functions

## ROUNDDOWN Function

The ROUNDDOWN function is used to round numbers to the closest decimal figures. The decimal figures in this example below is to the closest 2 decimal places. You can edit this value to allow the rounding to be bigger or smaller, as this allows for more precise. This helps prove the accuracy of data and allows for more edits to be made to ensure that data can be trusted.

### Illustration

	A	B	C	D	E
1					
2					
3			Round	Round Up	Round Down
4		4.83333	4.8	4.84	4.83
5		8.16667	8.2	8.17	8.16
6		4	4	4	4
7		6.33333	6.3	6.34	6.33
8		9.5	9.5	9.5	9.5
9					

## SUM Function

The SUM function is used to add two or more values together to provide a total. In the example screenshot below, all of the amounts of fruit are added together using the SUM function, to provide a total which is shown at the bottom of the sheet.

### Illustration

	C	D	E
	Fruit	Amount	
	Apples	50	
	Oranges	20	
	Bananas	60	
	Lemons	40	
			170

# Using Formulae and Functions

## MAX Function

The MAX function takes a list of values which are in a sheet, and outputs the value which has the highest overall value, this could be for currency or percentages. In the example below, the value for February is taken as it shows the maximum amount of profits made.

### Illustration

B7    ✕ ✓ <i>f<sub>x</sub></i> =MAX(B2:B4)			
	A	B	C
1	Month	Total	
2	Jan	£3,549,346.12	
3	Feb	£3,879,743.44	
4	March	£3,700,655.59	
5			
6	Least Profit	£3,549,346.12	
7	Most Profit	£3,879,743.44	
8			

## RANK Function

The RANK Function takes a list of numbers and provides a colour ranking system based on the format that you need the numbers to be in, this can be ascending or descending. In this example below, the regions that have earned the most money are ranked higher in the ranking column.

### Illustration

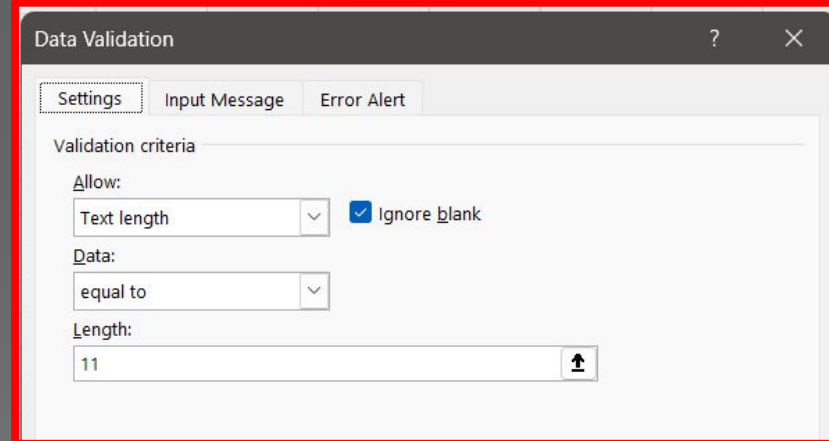
C17    ✕ ✓ <i>f<sub>x</sub></i> =RANK(B17,\$B\$2:\$B\$47)			
	A	B	C
1	Region	Quartely Sales	Rank
2	Accrington	£107,765.81	17
3	Blackburn	£109,516.32	16
4	Blackpool	£791,848.91	6
5	Bolton	£1,568,630.66	1
6	Bowland	£106,942.55	18
7	Cheshire	£45,876.18	22
8	Cumbria	£1,190,782.42	3
9	Flewick Thistleton	£468,471.18	8

# Validation and Verification of Data

Validation is a process of only allowing certain data to be input into a cell or collection of cells. This can be presence checks, which ensures that a cell is not left blank.

This could also be format checks which ensures that the format of data is correct, for example a telephone number has a specific format, you can ensure that data which is entered is in this correct format. It is crucial to do this to ensure that data which is incorrect cannot be entered, as this could damage the quality of the information which is being presented.

Validation is useful to gather high quality information, however, errors can be present if the validation technique is not fully carried out or if some human errors allow data through which should not be allowed to be entered.



The screenshot shows the 'Data Validation' dialog box with the 'Settings' tab selected. The 'Validation criteria' section is configured as follows:

- Allow:** Text length (dropdown menu)
- Data:** equal to (dropdown menu)
- Length:** 11 (text input field)
- ☒ Ignore blank

The dialog box has a title bar with a question mark and a close button. The 'Settings' tab is highlighted, and the 'Input Message' and 'Error Alert' tabs are also visible.

# Validation and **Verification** of Data

Data Verification is the process of ensuring that a data set is up to standard and matches reliable sources of information surrounding the same idea.

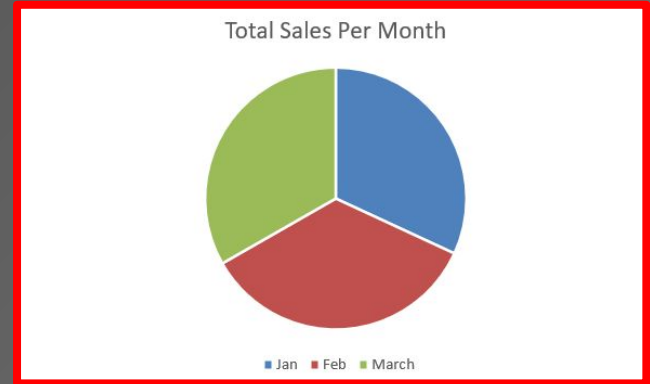


This process involves checking your procured data against other reliable sources of information to ensure that the data you have gathered has a high quality and is ready to be analysed.

The main way of doing verification checks is through manually checking data sets which are publicly available, this also helps a business prove that their data is reliable and high quality to ensure that the scenario is met.

# Analysing and Interpreting data

Analysing Data is the process of creating charts or visual representations of data, which allows raw data to be processed into charts which can be used in business scenarios for meetings or for write-ups.



Interpreting Data is the process which involves reviewing the data which has been analysed and coming to a reasonable conclusion. This data is manipulated and sculpted in order to answer the crucial questions which were needed to be answered for the scenario, this helps a business refer back to the decision making process steps in order to process their overall data results.

If the data is not analysed or interpreted correctly, this may provide issues for the decision making process when alternative routes are needing to be discussed, or when an evaluation is being made for the overall data models.

# Analysing and Interpreting data Tools

Pivot Tables are an easy way to summarise large amounts of data, these tables or charts also allow for data to be filtered allowing only data you specifically need to be shown on the spreadsheets when analysing raw data.

Conditional Formatting is a formatting type which also allows for data to be analysed and visualised in a way which shows a ranking process. For example, stock values for items above 100 can be coloured green, whereas if it is lower then the colour may change to red.



	A	B	C	D	E	F	G
1	City	Jan	Feb	Mar	Apr	May	Jun
2	Barstow	80	84	84	97	95	98
3	California City	78	86	84	96	98	102
4	Cinco	83	86	86	97	95	103
5	Hesperia	78	85	87	98	97	102
6	Lancaster	78	85	86	99	95	101
7	Mojave	82	85	86	98	96	99
8	Palmdale	81	84	85	97	95	101
9	Ridgecrest	81	87	87	97	96	98
10	Rosamond	82	86	88	99	97	101
11	Santa Clarita	79	85	87	95	96	103

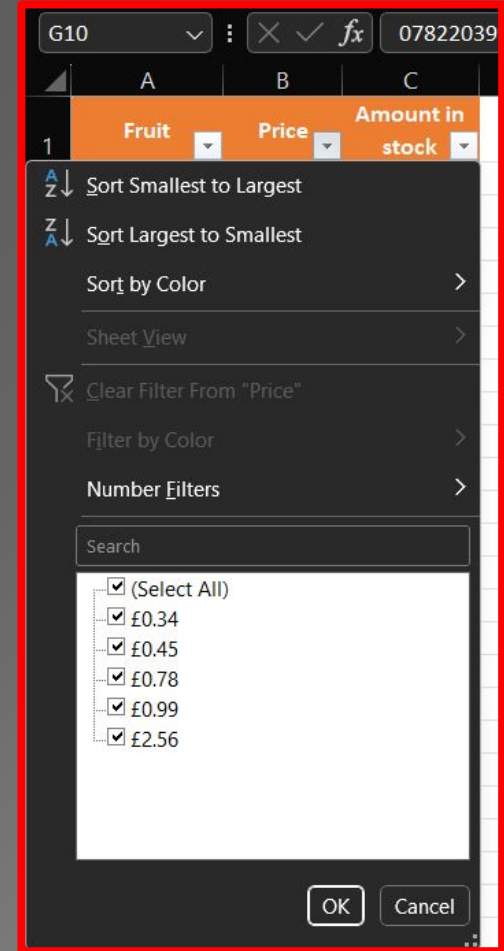
XLOOKUP is a function used for searching for specific information in a data set, this can be used to analyse the data extracted from a set, as this allows for ease of use compared to looking at a whole data set. This can be used to show that the data can be searched efficiently to match the scenarios needs.

# Analysing and Interpreting data

Filtering Data gives you the ability to isolate a column within a table in order to keep the data which is important and key when it comes to analysing data.

The sorting tool allows you to sort by, number, date or alphabetical order.

These tools allow for data to be analysed better for businesses as they can isolate this information and the specific and needed data can be shown after analysing data in face-to-face meetings which are a main part of the decision making process.

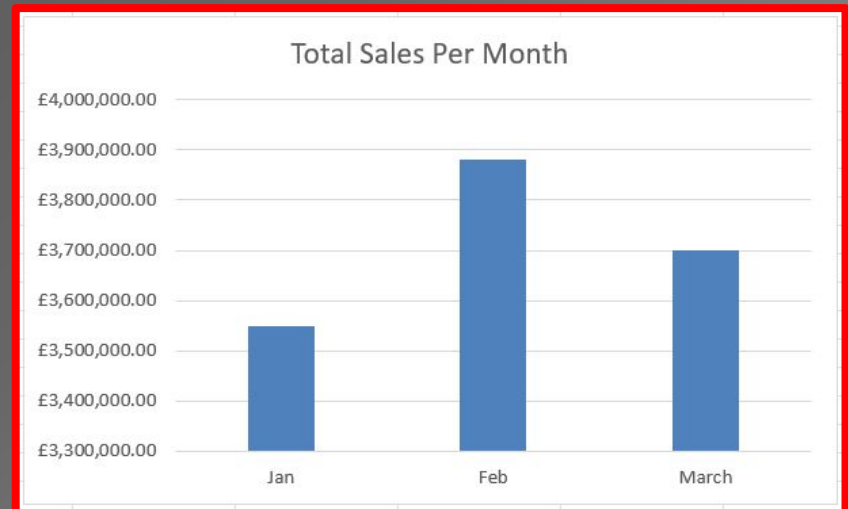
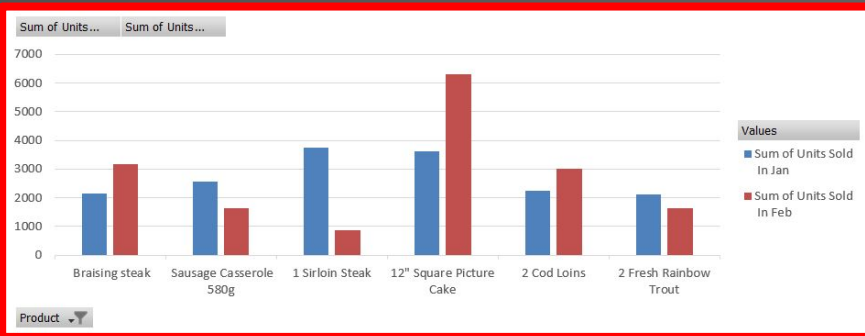




# Presenting Data

Presenting Data can be done through sorting, filtering and displaying data in many different ways. Sorting and filtering data allows for only specific and necessary data to be displayed, this helps a business to only display information that is necessary in the decision making process / data which was needed to be displayed as stated in the scenario.

If a method of presenting data is chosen but does not quite fit the data set which is being used, it may produce confusion based around the scenario, and trends in the data or anomalies may not be shown.



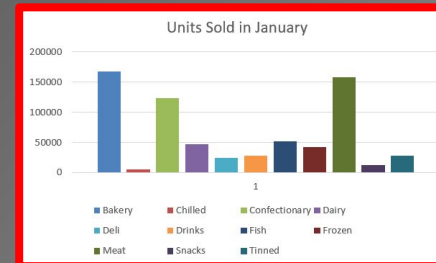
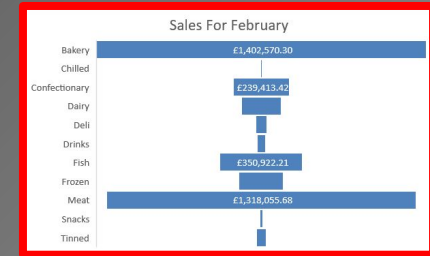
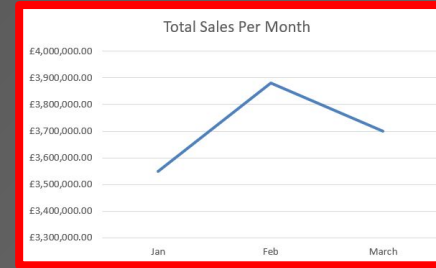
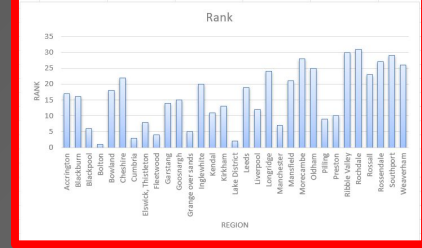
# Presenting Data

There are many benefits to displaying data in different ways, and this can help a business find trends in data, or to see if they have any anomalies in the data set they have gathered.

Displaying data in different formats allows key information to be isolated from the original data set. For example, product information data set is very large due to all the different data, allowing for specific data to be displayed on different charts ensures that no errors may be made due to the lack of structure.

Being able to present data in different formats also is able to show that the scenario has been understood, as the shown data matches what was asked for at the beginning of the decision making process.

Different examples of displaying data include: Pie Charts, Histograms, Bar Chart, Line Graph.



# Presenting Data

Being able to sort and arrange data allows for the raw data set to be displayed in a simple way which is easily understandable by clients, whether these are clients involved with the scenario or for in business meetings.

3	cranstons-salt marsh lamb	£689,483.00
4	Four Bird Luxury Box	£602,004.00
5	12" Square Picture Cake	£491,700.00
6	12" Square Picture Cake	£424,531.25
7	9" Round Picture Cake	£390,312.00
8	9" Round Picture Cake	£262,333.50
9	Whole Leg of Lamb	£252,885.60
10	Chocolate Covered Kendal Mint Cake Discs Gift Boxes	£238,950.00
11	Cranston's Cumberland and Sausage Selection	£195,580.00
12	9" Square Picture Cake	£172,236.75
13	Fillet Steak	£136,625.00
14	Cod	£105,831.05
15	Fresh Pork Large Leg Joint	£97,868.68
16	clifton quality meats-pork chops	£93,236.67
17	Catfish	£89,952.00
18	Topside Steak	£87,800.00
19	Sirloin Steak	£81,298.00
20	Lobsters	£80,948.79
21	Ginger Bakers - Lovers Loaf	£80,748.00
22	Lamb Steak	£77,560.00
23	Tender beef	£74,950.00
24	Rib eye Steak	£74,070.00
25	Pesto Pork Loin	£72,917.01
26	Ginger Bakers - Pecan Caramel Shortbread	£72,528.00
27	Rump Steak	£71,808.00
28	Ginger Bakers - Sticky Ginger Fudge	£70,173.00

Sorting data also helps contribute towards the decision making process, as this allows the people involved in the scenario to come to quick decisions and to analyse the output information quickly and effectively.

Arranging data also allows a set of data to be displayed in a logical format, if to begin with, the data set had cells misplaced, they can be arranged to find alternatives in the spreadsheet for the decision making process.

For example, Sorting finance profits in descending order allows the largest profits to be displayed at the forefront of the data displaying charts.

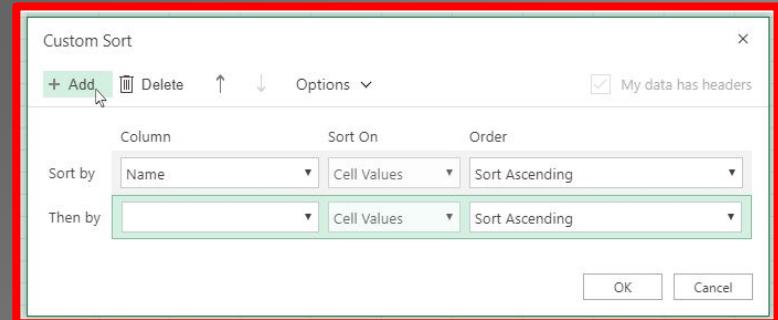
# Presenting Data

In conclusion, using excel as a whole during the decision making process provides many benefits and can help when it comes to analysing and presenting data.

Excel provides many different formats when displaying data, which can show a variety of trends or prove if the quality of information has some flaws such as anomalies.

Excel sorting and arranging tools can help before displaying data, as they provide basic formats for sorting such as ascending and descending or sorting date and time values.

Both of these make the decision making process easier, as the data can be matched to the scenario and the data present can be easily understood as a whole.

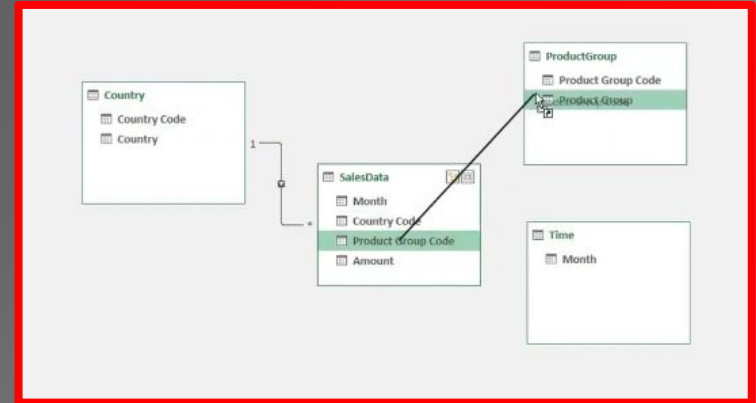


# Using data modelling to consider alternatives

Data Modelling is the process of creating different visualisations of data, which can be used on Excel. Data modelling also creates reliability and credibility as the formulas can be seen by other people working in the decision making process, this shows that the data has been fully analysed and that errors will be less present.

However, Data modelling can be complex, and without the necessary skills the analysis can go wrong. This will halt the decision making process as alternatives need to be considered from the possibility of data modelling predicting future statistics.

Data models show the links between sheets which can help determine the formulas used.

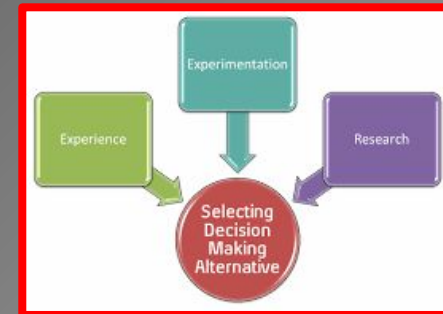
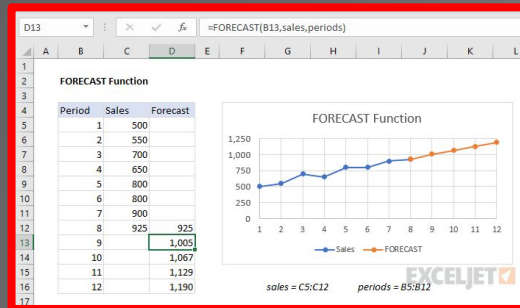


# Using data modelling to consider alternatives

Alternatives should be discovered and discussed in businesses as finding useful alternatives can help the business come to a rational and informed decision when concluding which data model should be used for the scenario at hand. Some alternatives however may be more complex than others, and some other alternatives may provide negative interactions and could hinder the decision making process by matching the scenario less than needed.

Spreadsheets can be used to consider alternative routes due to the fact that these models can also be used to predict the events for a business in the future, which helps discuss alternatives in the decision making process.

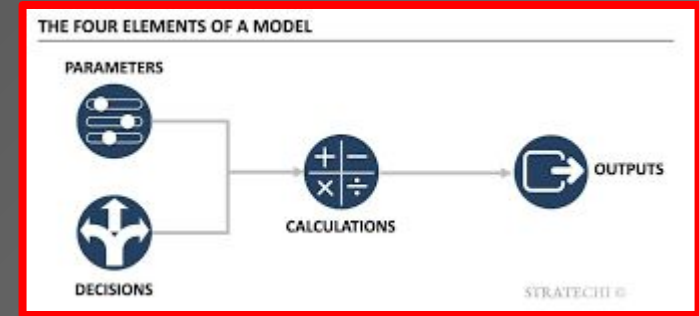
For example, A forecast can be made on a spreadsheet software. However, predictions are not seen as 100% correct, and flaws may be present, which shows that taking alternative decisions may prove as a risk.



# Evaluating the model

Evaluating a spreadsheet model is important as you can check that the input data provides and displays data models which are matching to the scenario. The data models which have been provided towards the end of the decision making process need to be reflective of the original scenario provided. For example, if the scenario is asking for a model which displays monthly profits at a convenience store, then the model needs to display this and should be evaluated at the end.

If a poor evaluation is carried out on the data model, then issues may be present and the scenario may not be met due to the lack of evidence and credibility that the business is asking for.



Evaluating the model allows you to pick out where each stage has been used, whether these are the decisions or the calculations, they all provide the needed output for the scenario at hand.



# Evaluating the model

Decisions then can be made using this model. These decisions could be making changes to a business in areas which need it. Whether the model predicts future events or not, it can be used to make crucial decisions for a business as a whole. If the data is not fully correct then the decisions which are aimed to be made may be incorrect.

Improvements can always be made to the model, and meetings are held throughout the decision making process. A meeting can be held to discuss improvements, which can be about including or excluding information in models, or using different formatting such as, rounding to two decimal points instead of one. These small features for improvements may be crucial to the business and their scenario.

models	options	components
Model A	Option 1	Comp 1
Model B	Option 2	Comp 2
Model C	Option 3	Comp 3
Model D	Option 4	Comp 4
Model E	Option 5	Comp 5
	Option 6	Comp 6
	Option 7	Comp 7
	Option 8	Comp 8
	Option 9	Comp 9
	Option 10	Comp 10

# Evaluating the model

Errors may be present when evaluating a model, which also plays a role in providing improvements to be made to the model. Functions and formulas may not work in some situations which can provide errors to the model, this can be fixed however.

Negatives can include, but are not limited to, models having field name problems, some models can be created automatically, such as pivot charts, yet if errors with the fields are present then you will have to manually model the data in order for it to be classed as credible and analysed well. If it has not been analysed well before the model was created, then the clients from the scenario themselves will not be able to provide an in depth evaluation with possible improvements.

	A	B
1	#VALUE!	#REF!
2	#NUM!	#N/A

Possible excel field name errors.

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