



British Computer Society
The Chartered Institute for IT
Consultancy Specialist Group
and London Central Branch

Webinar

Effective Research
Techniques

Paul Taylor MBA, MBCS, FRSA,
CMgr, FCMI - 13th May 2021





Effective research techniques and approaches

Paul Taylor
MBA, MBCS, FRSA, CMgr, FCMl

13th May 2021

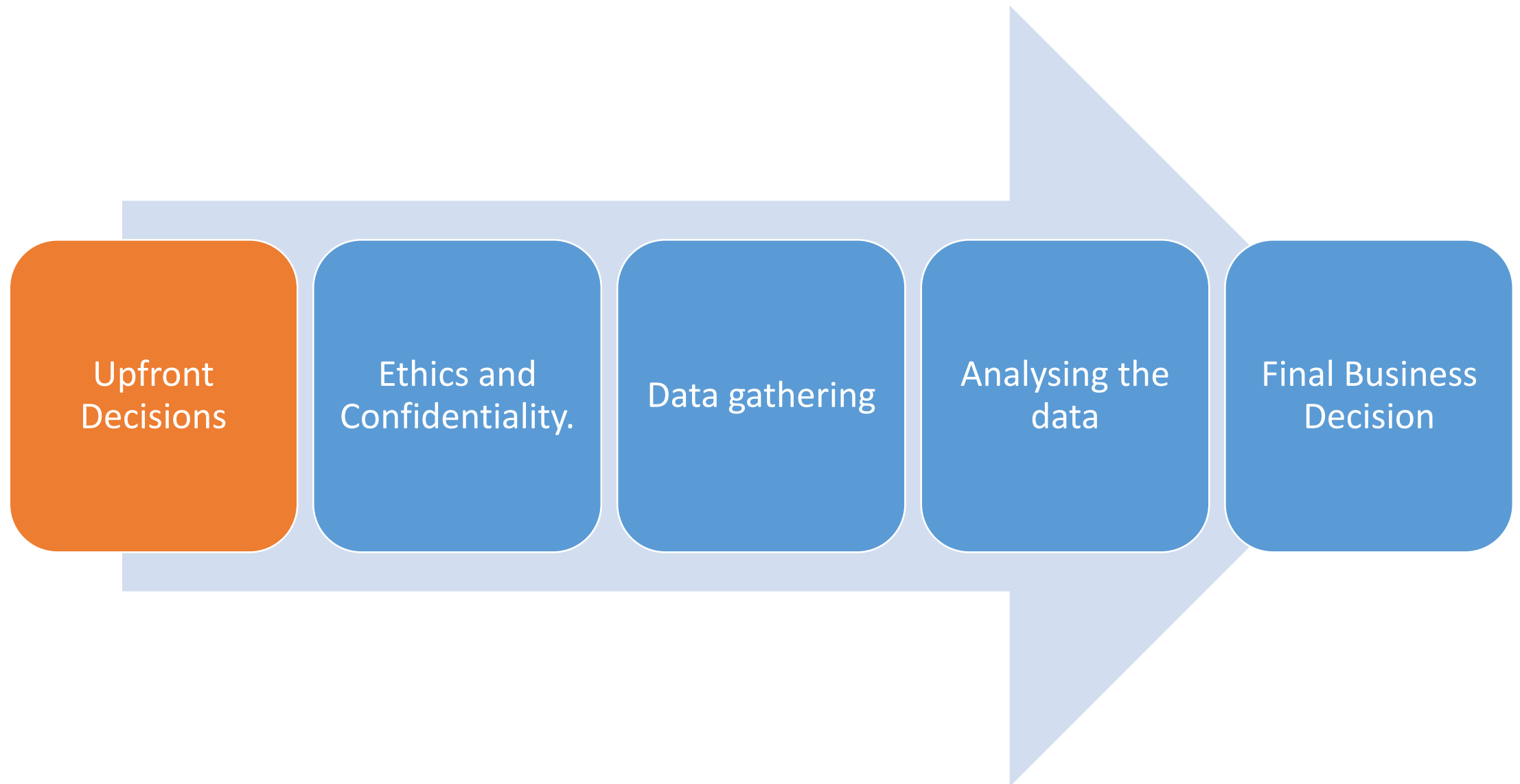
About me – Paul Taylor

- Consultant with over 30 years experience of implementing change across the financial services, oil/gas, charities and professional bodies.
- Author and speaker on a variety of subjects
 - Change , freelancing, technology, financial services, research approaches, etc
- Published a books called
 - “So you want to go contacting”
 - “So you want successful change”
- Chair and NED for a variety of industry and social enterprises
 - Gambling Addiction awareness CIC
 - Performing Arts for BAME population CIC
- Mentor to various people on areas on career planning, career changes, etc.
- An Associate Lecturer for the Open University STEM school teaching Technology Management.
- Obtained an MBA from the Open University. Studying for a PhD at Middlesex University.

What is research? And why is it important?

- There are many definitions but two taken from Google search:
 - “....investigate systematically....”
 - “The systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions”
- But why is it important ?
 - Having the ability to perform effective, robust, reliable and unbiased research is a key capability for everyone
 - These range from small tactical decision up to large material strategic decisions

Agenda



Upfront Decisions



- Some sort of forum needs to be formed to oversee and steer the research
 - Working group
 - Steering Group
 - Board of Directors
 - Etc
- Escalation point for issues and decisions
- Guidance on timescale, funding, etc
- Final approval of the research

Upfront Decisions



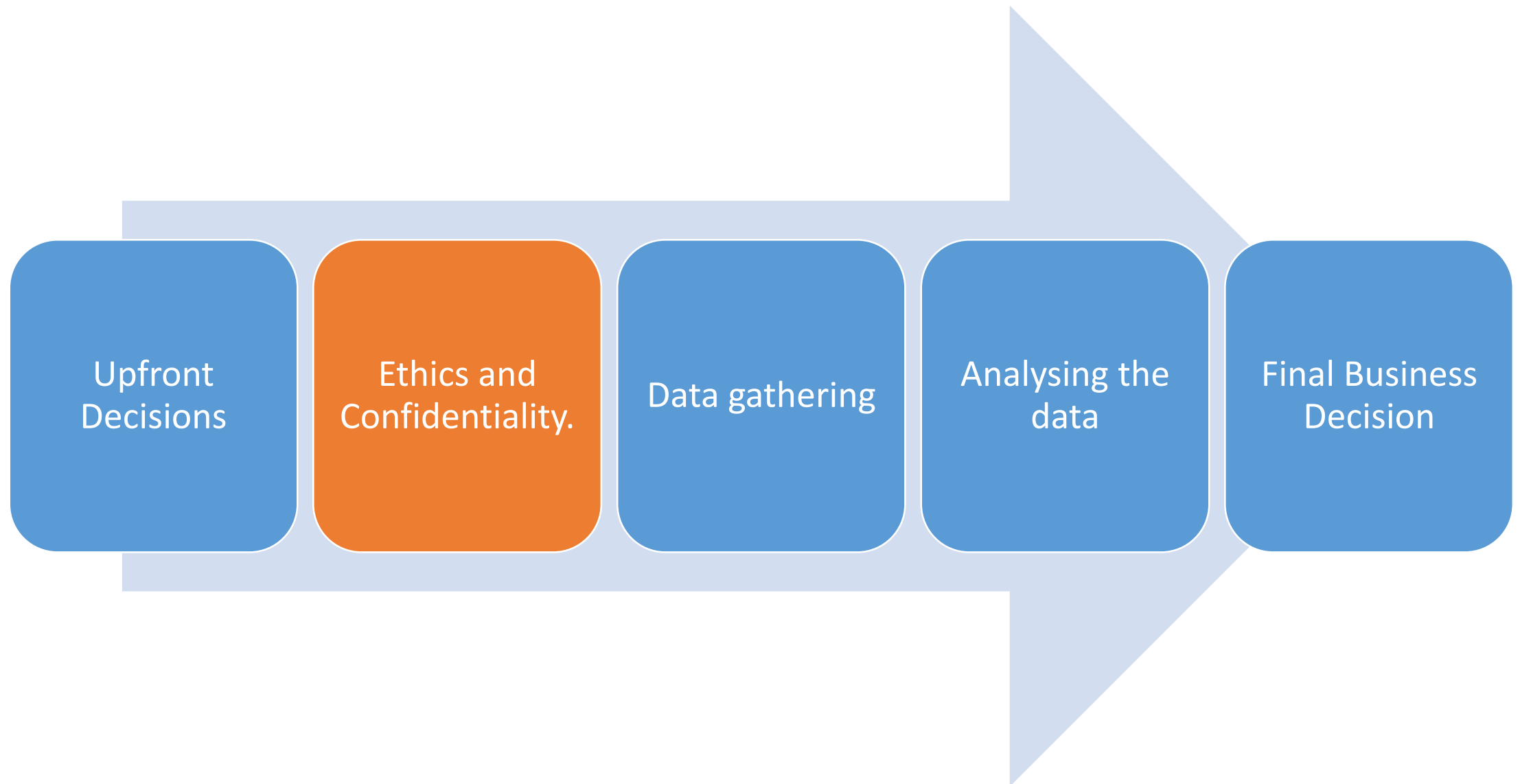
- What are you 'really' trying to investigate, research, find out, etc?
- Top Down Objective to research a specific issue or decision
 - Test a specific issue.
 - Should we open an office in France? Should we purchase XYZ company? etc
- Bottom Up Objective to investigate an open area
 - Obtain data to make a decision.
 - Where should we look to move manufacturing? Etc

Upfront Decisions

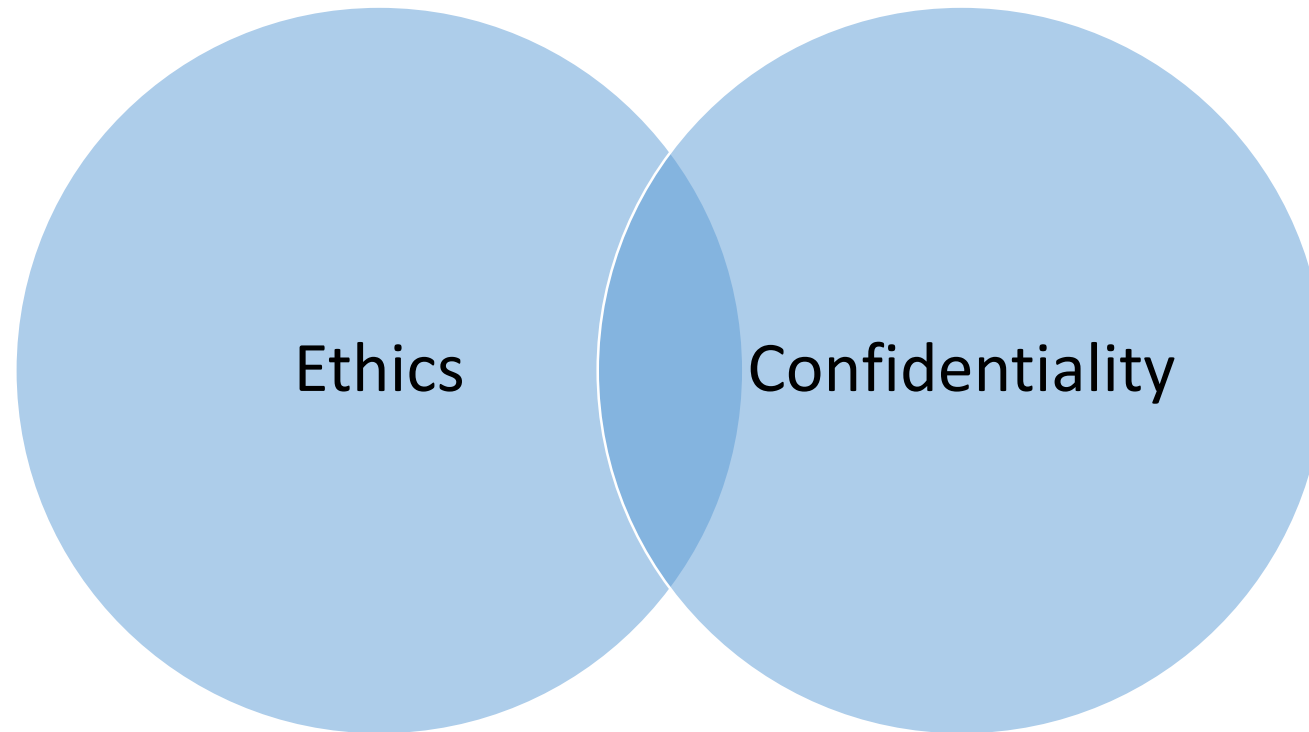


- Break down the Research Objective into a set of a focused questions to meet it
 - No limit to the number of questions but ensure they focused on the Research Objective
 - Weighting of the questions?
- Top Down Research Objective
 - Generally narrow, focused and closed questions
 - Open office in France - How much will it cost to open an office in France? What is the impact to the other EU offices?
- Bottom Up
 - Generally open, exploratory and wide questions.
 - Moving manufacturing – Where are the main areas of expertise? What are our competitors doing? etc

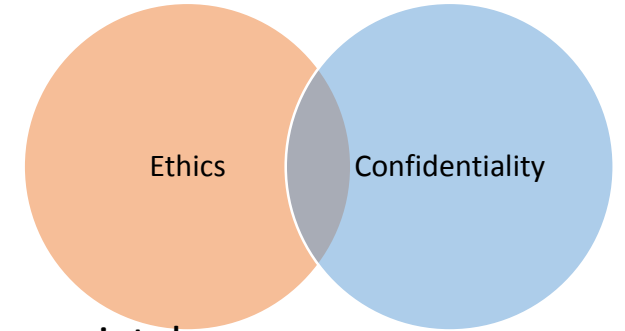
Agenda



Ethics and Confidentiality



Ethics



Why is this important?

- Research is not an island - needs input from other people and groups
- The data provided could be uncomfortable or awkward if discovered
- Therefore contributors need to comfortable data will not be used or published inappropriately
- Ensures researcher need to be held to account.

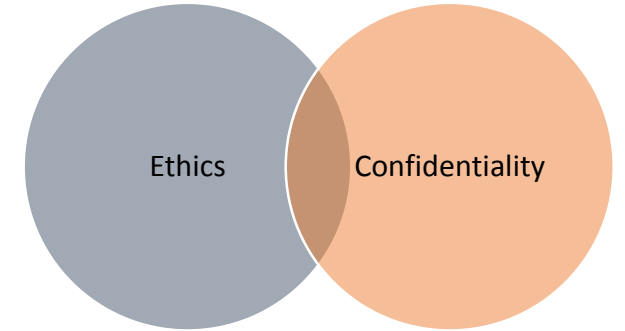
Academic bodies and organisations should have ethical policies

- Informed consent
 - All participants are invited to participate in the project,
 - Give consent to do so based on information provided about the project,
 - Made aware of their right to withdraw from the project at any point for any reason.
- All participants are guaranteed anonymity (and will be told about this when they are approached to be involved)
- Offer participant a free copy of any outputs from the research?
- Do not hassle participants regarding their involvement

Confidentiality

Why is this important?

- Ethic issues discussed earlier
- Plus legal issues (with serious penalties for non-compliance)



Main UK law is called “General Data Protection Regulation (GDPR)” and focuses on Personal Information (PI).

Although there is similar legalisation around the world

- US - California Consumer Privacy Act (CCPA)
- Japan - Act on the Protection of Personal Information
- Australia - Privacy Act 1998

GPDR Seven key principles

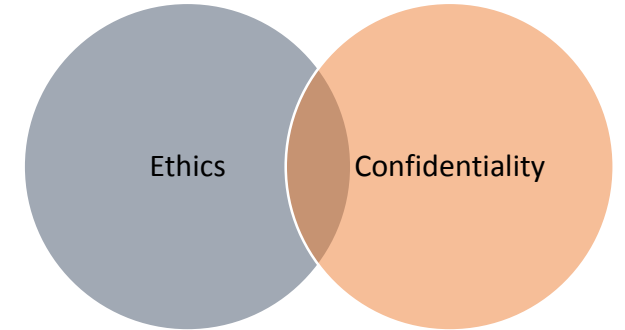
- Lawfulness, fairness and transparency.
- Purpose limitation.
- Data minimisation.
- Accuracy.
- Storage limitation.
- Integrity and confidentiality (security)
- Accountability.

Confidentiality

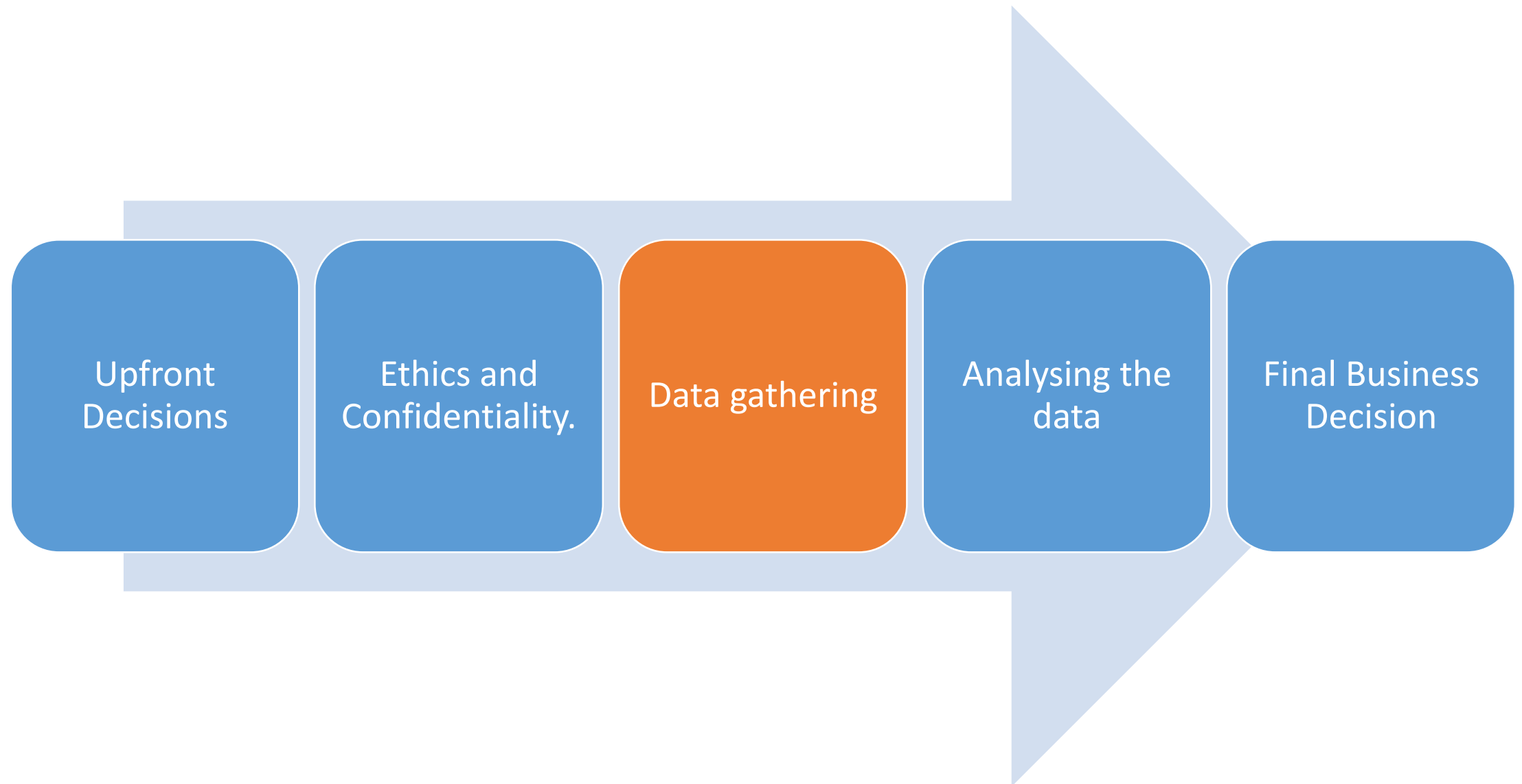
GDPR Rights for data subjects

- To be informed – what categories of their PI is being gathered?
- To opt out – ask businesses to stop selling their PI or using it for business benefit
- Deletion – can ask businesses to delete their PI - i.e. the right to be forgotten
- Access – to provide the list of actual PI attributes gathered.
- Non-discrimination – i.e. cannot discriminate against a person for exercising their rights

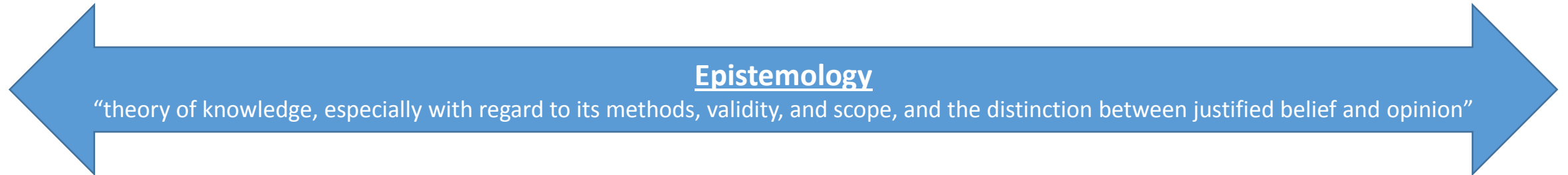
Therefore need to ensure these are included in any research plan etc.



Agenda



Different types of data and information.



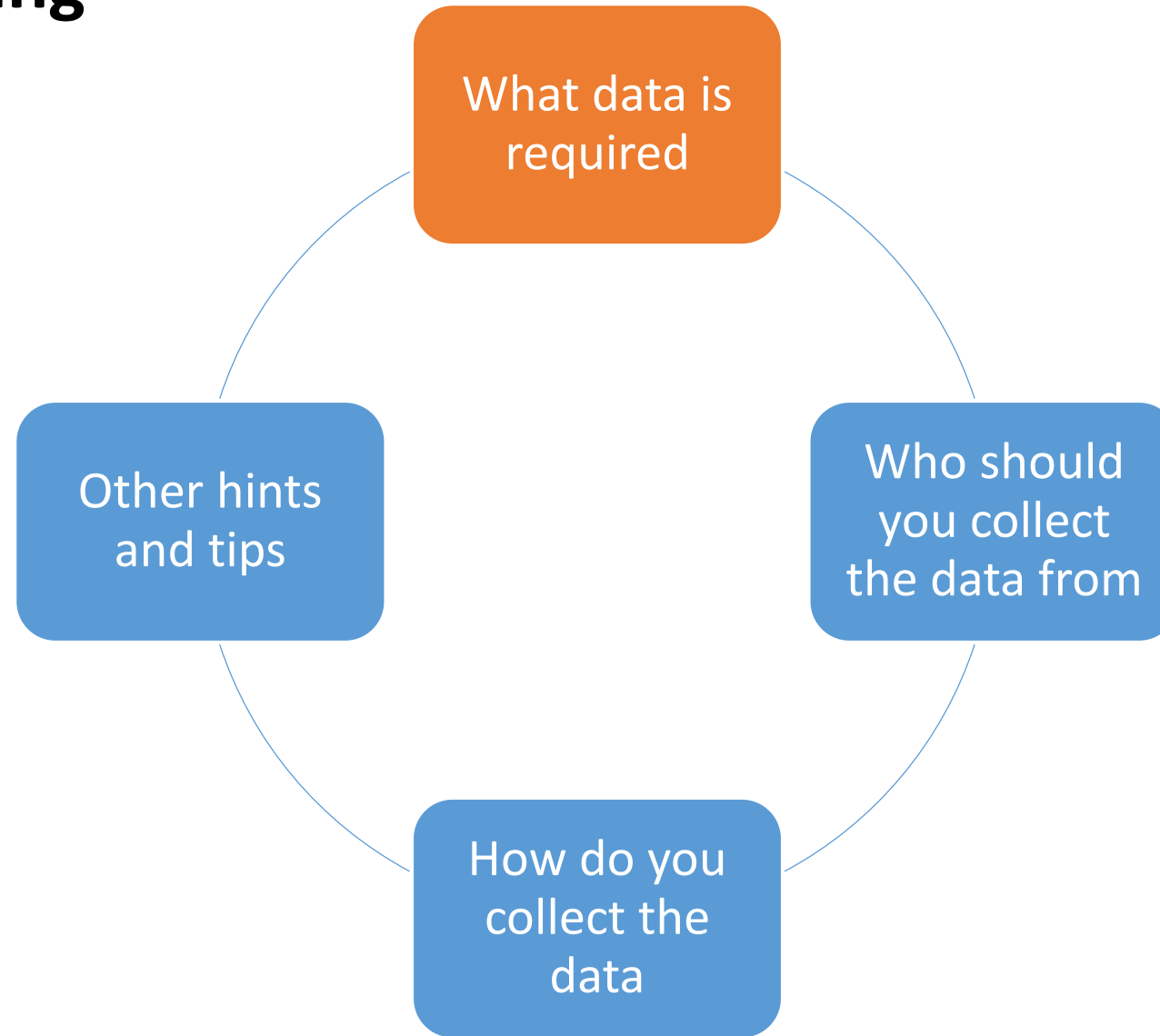
Quantitative	Combination of both	Qualitative
Positivisms	Realism	Interpretist
Objective		Subjective
		Constructed

It is important to understand the information and data you are likely to collect

- Different data gathering methods
- Different data issues
- Different ways of assessing

Often a good idea to look at both types of data.

Data gathering



Data Gathering – What data is required?

This is a massive area and would take many hours to discuss but put simply:

***What data is required to answer the Research Questions
(and in turn meet the overall Research Objective)?***

Data can be looking at through two lenses

- The type of data needed?
- How the data can be sourced?

Data Gathering – What data is required?

There are two main types of data (although a combination of both is recommended)

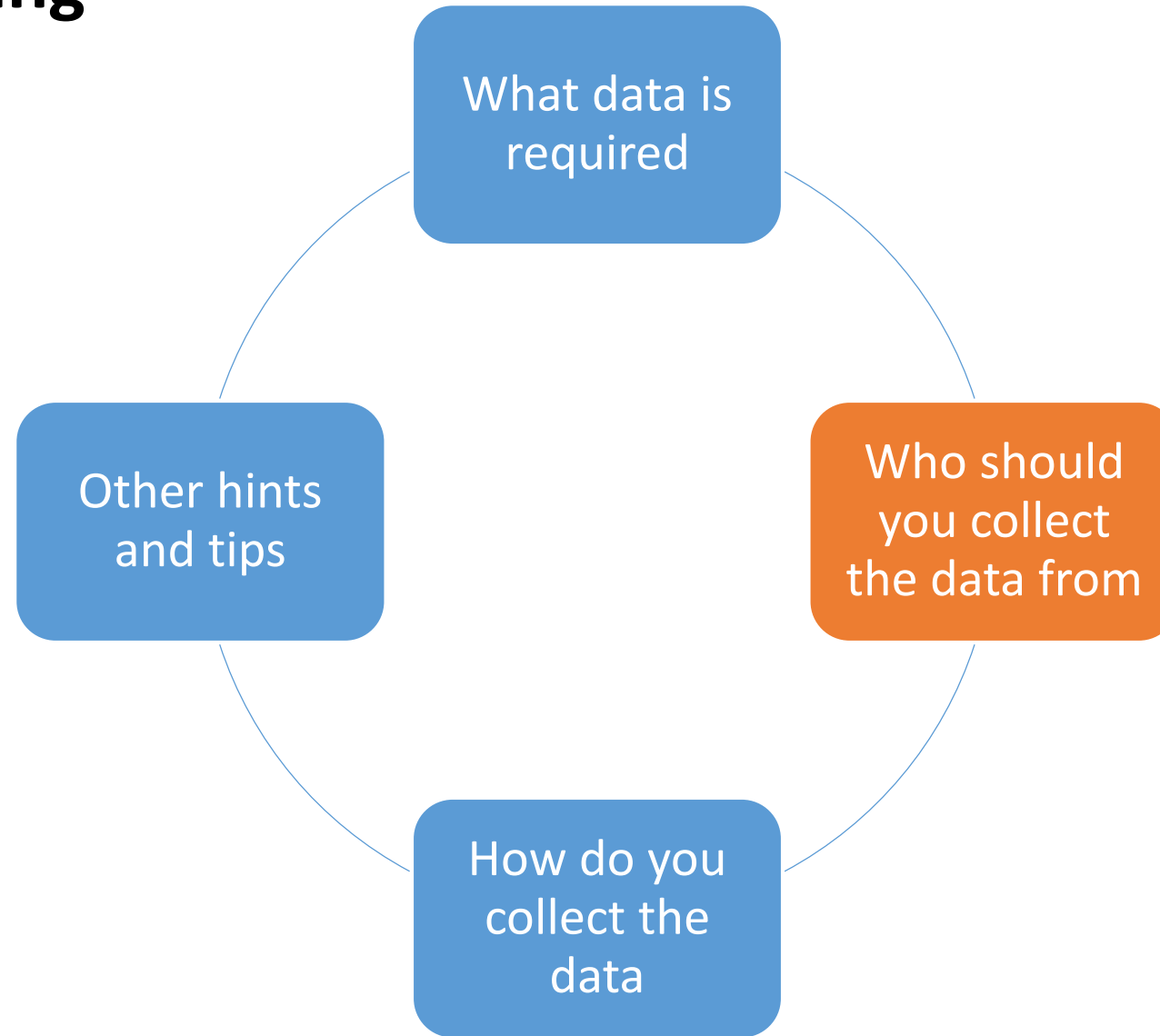
Type	Description	Advantages	Disadvantages	Examples
Quantitative	Numerical data	Very efficient. Easier to test	Misses wider context and therefore can be misleading	Statistics Numeric tables
Qualitative	Non-numerical such as opinions, views, etc.	Will provide in-depth assessment The data provided will be rich and detailed Allows themes to be discovered	Can be hard to assess Can be bias towards the researcher	Themes on why something happens Explanations for behaviours.

Data Gathering – What data is required?

There are two ways of sourcing data (although again a combination of both is suggested)

Type	Description	Advantages	Disadvantages	Examples
Primary	Research that you collect yourself.	Allows better focus on the research questions	Can be a lengthy and costly process	Interviews, focus groups, etc.
Secondary	Research that uses data gathered by other people.	Can be collected and assessed much quicker.	May be hard to get research that matches your research questions. May include bias	Government or trade association reports. News reports.

Data gathering



Data Gathering – Who should you collect the data from?

- Need to understand your target audience?
 - Primary = People, areas, firms, gender, etc.
 - Secondary = Which publications, authors, journals, web-sites, etc?
- Total Population = Everybody you can speak to
 - Full client base? All suppliers of a certain product? All people in UK? Etc.
 - However this is often impractical, requires lots of time, logistics, etc
- Therefore need to create a representative sample
 - Need to understand the dynamics of your population
 - Age, gender, location, size, profitability, etc.
 - Pick a sample that matches this closely.
 - More is not always best !!!

Data Gathering – Who should you collect the data from?

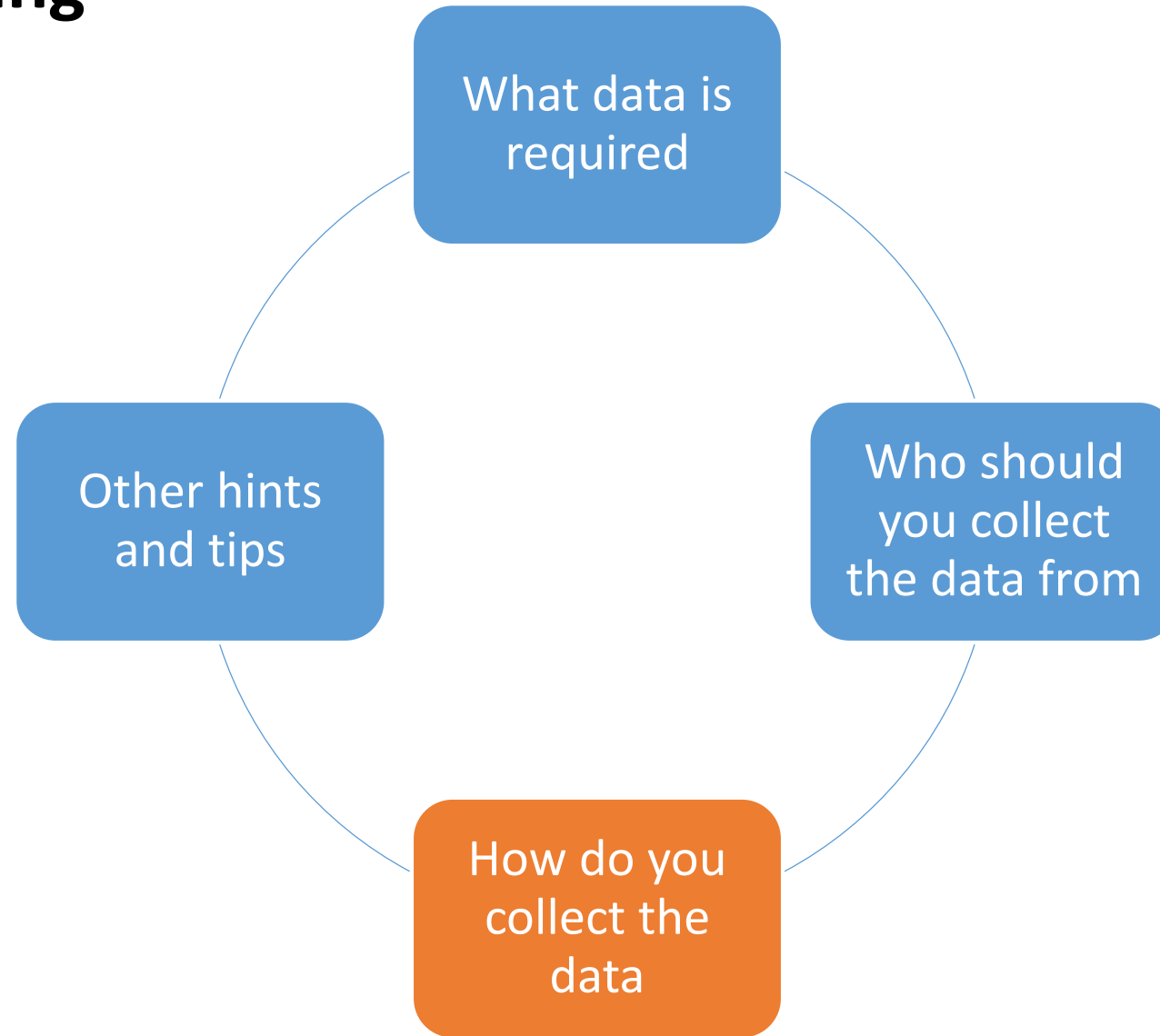
How do you create a sample then?

Type	Description	Challenges
Random	Pull them 'out of the hat'	Access to the full population to select from
Systematic	Every n'th participant on the list	Access to the full population to select from
Stratified	Group sample into 'like group' (e.g. gender) and then randomly select from each group	Access to the full population to select from
Cluster	Group sample into 'like groups' (e.g. location) and focus on each group	Access to the full population to select from
Convenience	Use what is available	Lack of representation and therefore bias
Judgemental	An experience person selects the sample based on judgement	Poor judgement can create bias But good judgement creates value
Snowball	Obtain sample from initial respondents.	Can create bias

Data Gathering – Who should you collect the data from?

- Sampling is not an easy process and some problems cannot be worked around
- The sample does not represent the target population
 - Areas missing
 - Lop sided to certain areas
- This can create bias
- Therefore important to clearly state any issues, gaps, etc PLUS the assumptions taken

Data gathering



Data Gathering – How to collect the data?

There are various methods (each with their own good and bad points)

The approach is dependent on:

- Sample available
- Type of data required – e.g. Qualitative vs Quantitative
- Sources of data required – e.g. Primary vs Secondary
- Time available to complete the work.
- Money available to spend on the research
- Skills of the researcher
- Plus many other factors.

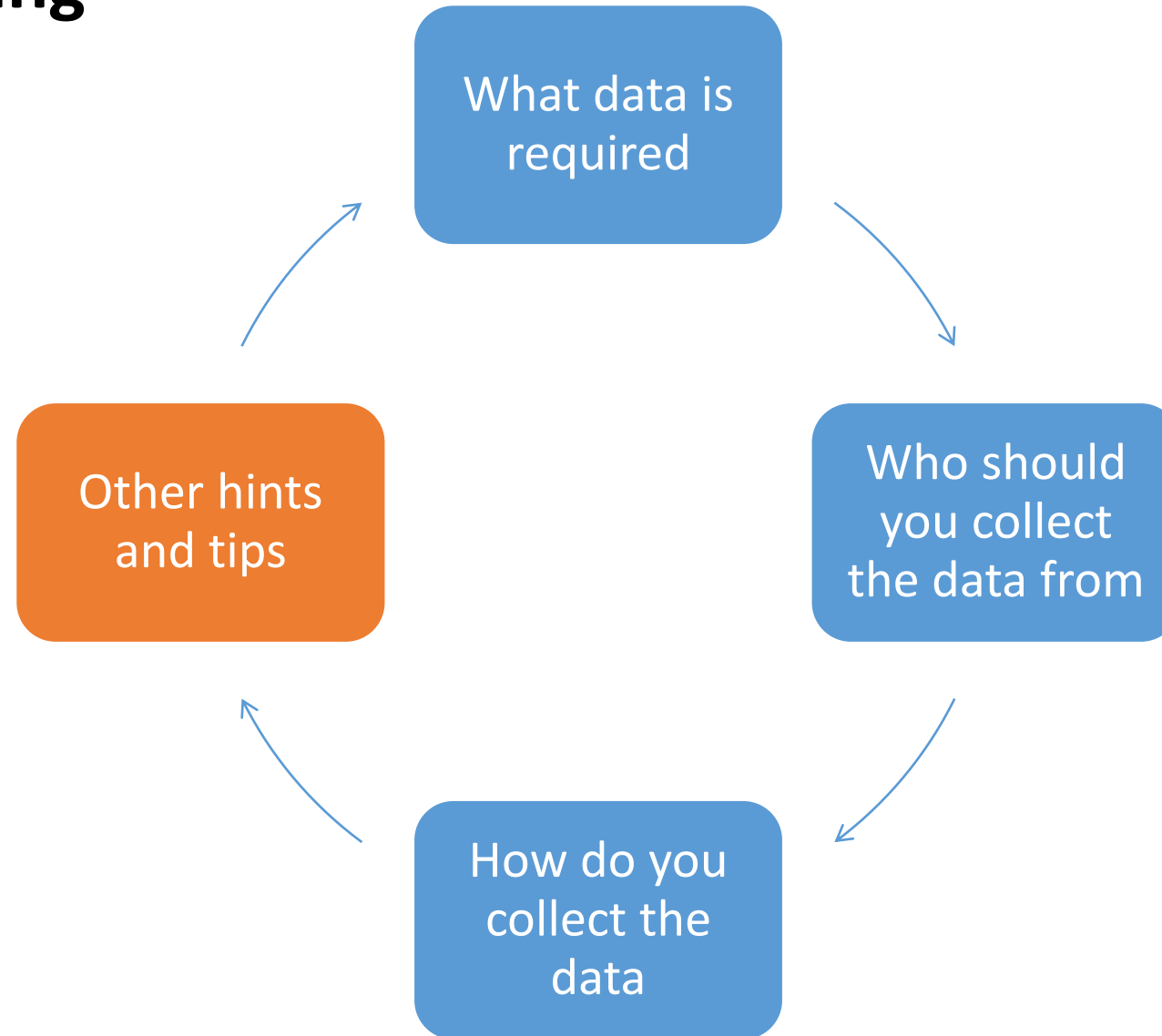
Data Gathering – How to collect the data?

Technique	Type	Source	Advantages	Disadvantages
Interview	Qual	Primary	<ul style="list-style-type: none"> Allows detailed questions to be asked and often has a high response rate. People are also more likely to be open and honest on a 1-2-1 basis. 	<ul style="list-style-type: none"> Very time-consuming to arrange, hold and document interviews.
Focus Groups	Qual	Primary	<ul style="list-style-type: none"> They are quicker to run than 1-2-1 interviews. Allows one to speak to a large number of people at the same time. The dynamics of the group could allow good discussion and output. 	<ul style="list-style-type: none"> They can be dominated by one or two people which means the outputs tend to reflect their views as opposed to the wider group. There could be arguments and conflict in the meeting. The meetings can be hard work to prepare for and manage.
Questionnaires / Surveys	Both	Primary	<ul style="list-style-type: none"> Quick to set up. Can be issued to a wide range of people. People can answer them at their own speed. Data is collected in a standardised way. 	<ul style="list-style-type: none"> People may not respond or not answer the questions properly. People may misunderstand the questions being asked. If there are errors in the questions then the data will be poor. It is not possible to go back and ask further questions.

Data Gathering – How to collect the data?

Technique	Type	Source	Advantages	Disadvantages
Analysing documentation / Desk Research	Both	Secondary	<ul style="list-style-type: none"> • Very cheap and can be quick to do. 	<ul style="list-style-type: none"> • There may not be sufficient documentation available. • Data may not match your research questions • It is not possible to obtain people's opinions first hand.
Observations	Both	Primary	<ul style="list-style-type: none"> • Will obtain some good insights 	<ul style="list-style-type: none"> • Can take a long time • People react differently when being observed.
Data Feeds	Quant	Both	<ul style="list-style-type: none"> • Quick to assess 	<ul style="list-style-type: none"> • There may not be sufficient data available – e.g. missing variables, data incomplete, etc. • Data may not match your research questions • Data can be expensive or hard to understand • It is not possible to obtain people's opinions first hand.

Data gathering



Data Gathering – Other hints and tips

You will have problems (sorry)

- The sample could be wrong?
- Participants may not want to help or provide all the data required?
- The wrong data may be requested?

There are some mitigations and involves using a combination of approaches to cross data and improve confidence in the results

- Qual vs Quan data
- Primary vs Secondary data
- Different data gathering approaches
- Weighting parts of the research?

But need to clear if one approach supports the other or are they used together

Remember clearly state any issues, gaps, bias, problems, etc encountered.

Data Gathering – Other hints and tips

Pilot Studies to test the data gathering process

- Are you collecting the correct data?
- Is the data gathering process fit-for-use?

Data Gathering – Other hints and tips

Two examples

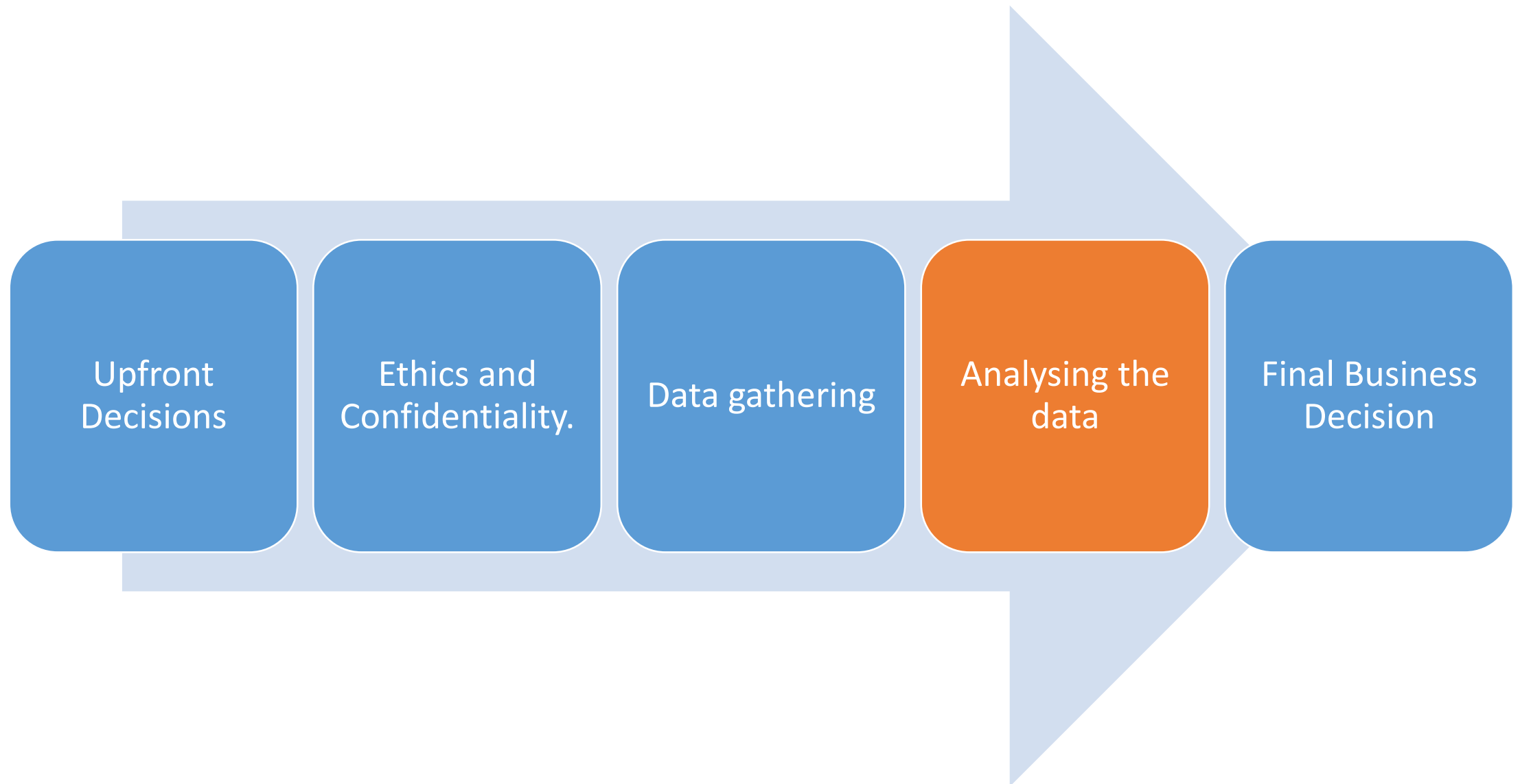
Due diligence on a new supplier

	Quan / Qual	Primary /Secondary	Data Gathering
Due Diligence Questionnaire	Quan mainly	Primary	Questionnaire
Industry research on key providers	Both	Secondary	Desk Research
Due Diligence follow-ups	Both	Primary	Interviews (or meetings)

Looking to open a new office in a new geographic region

	Quan / Qual	Primary /Secondary	Data Gathering
Market research on geog areas	Both	Secondary	Desk Research
Economic research on geog areas	Quan mainly	Secondary	Desk Research
Interviews with key customers etc	Qual	Primary	Interviews / focus groups

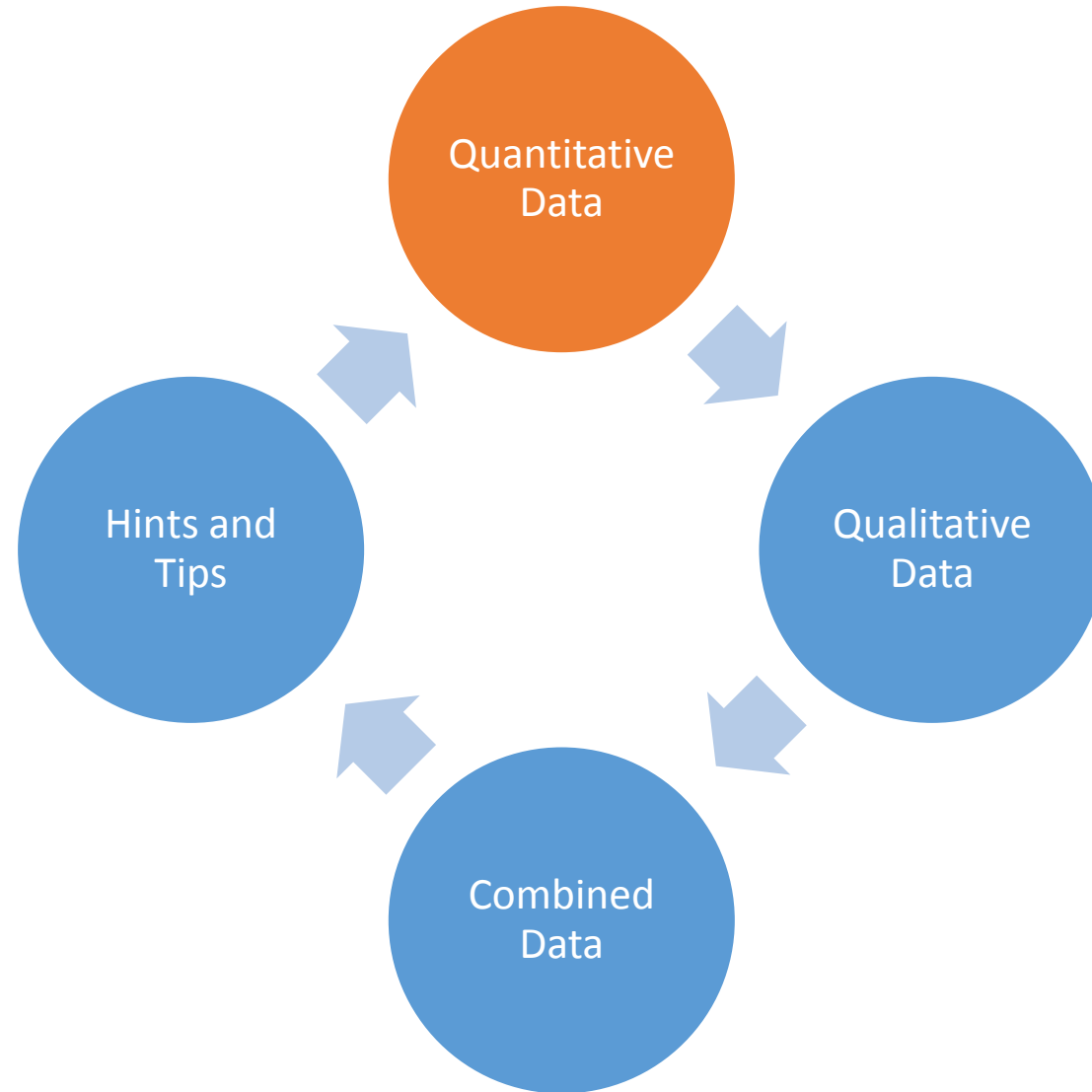
Agenda



Analysing the data

- This is the crux of the entire project
- Consolidate the data gathered into a format that hopefully answers the Research Question (and therefore Research Objective)
- This is not an easy task and would take a long time to explain all the best methods etc.
- Different approaches are required for
 - Quantitative data
 - Qualitative data
 - Combination of both
- This area is also very problematic

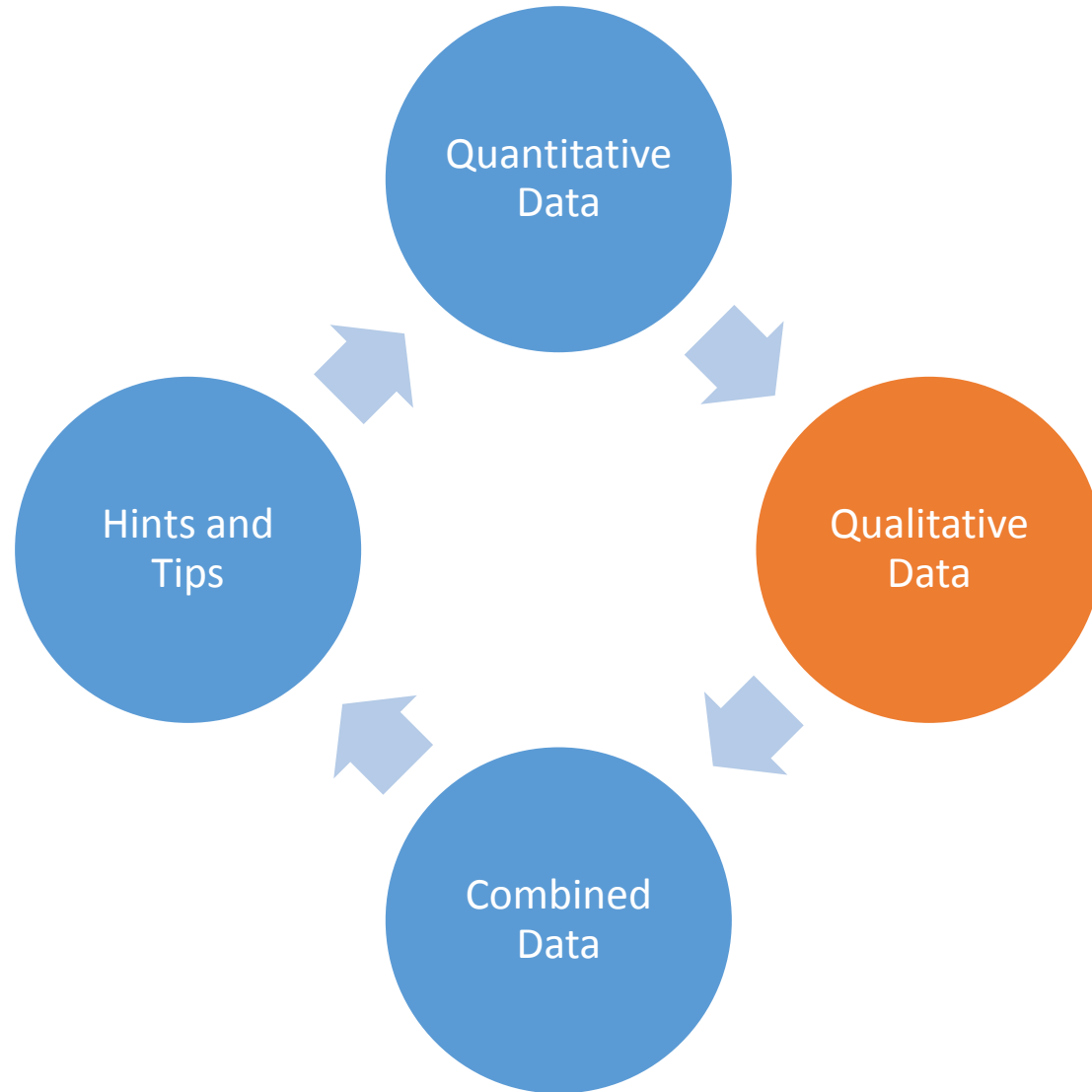
Analysing the data



Analysing the data – Quantitative Data – Stats etc

Purpose	Tools / Techniques	Comments
Central Tendency	<ul style="list-style-type: none">• Mean• Mode• Medium	<ul style="list-style-type: none">• Very simple to calculation but can give some strange results – e.g. 2.4 children
Dispersion	<ul style="list-style-type: none">• Variance• Standard Deviation	<ul style="list-style-type: none">• Again very simple but can produce some bizarre results if there are a wide range of values.
Trends	<ul style="list-style-type: none">• Regression Analysis	<ul style="list-style-type: none">• Can produce some interesting (and not that obvious) outputs• But can produce some ‘weird’ trends – e.g. link between size of telephone bill and the amount of ice cream eaten.• Remember correlation does not match causation
Groupings	<ul style="list-style-type: none">• Clustering	<ul style="list-style-type: none">• Similar to trends above. It can produce some interesting outputs as well as some strange ones
Behaviours	<ul style="list-style-type: none">• Decision Trees• Algos• Models• Neuro Networks	<ul style="list-style-type: none">• Very powerful set of tools but (a) need a lot of data (b) need a large amount of testing and development and can be (c) hard to understand

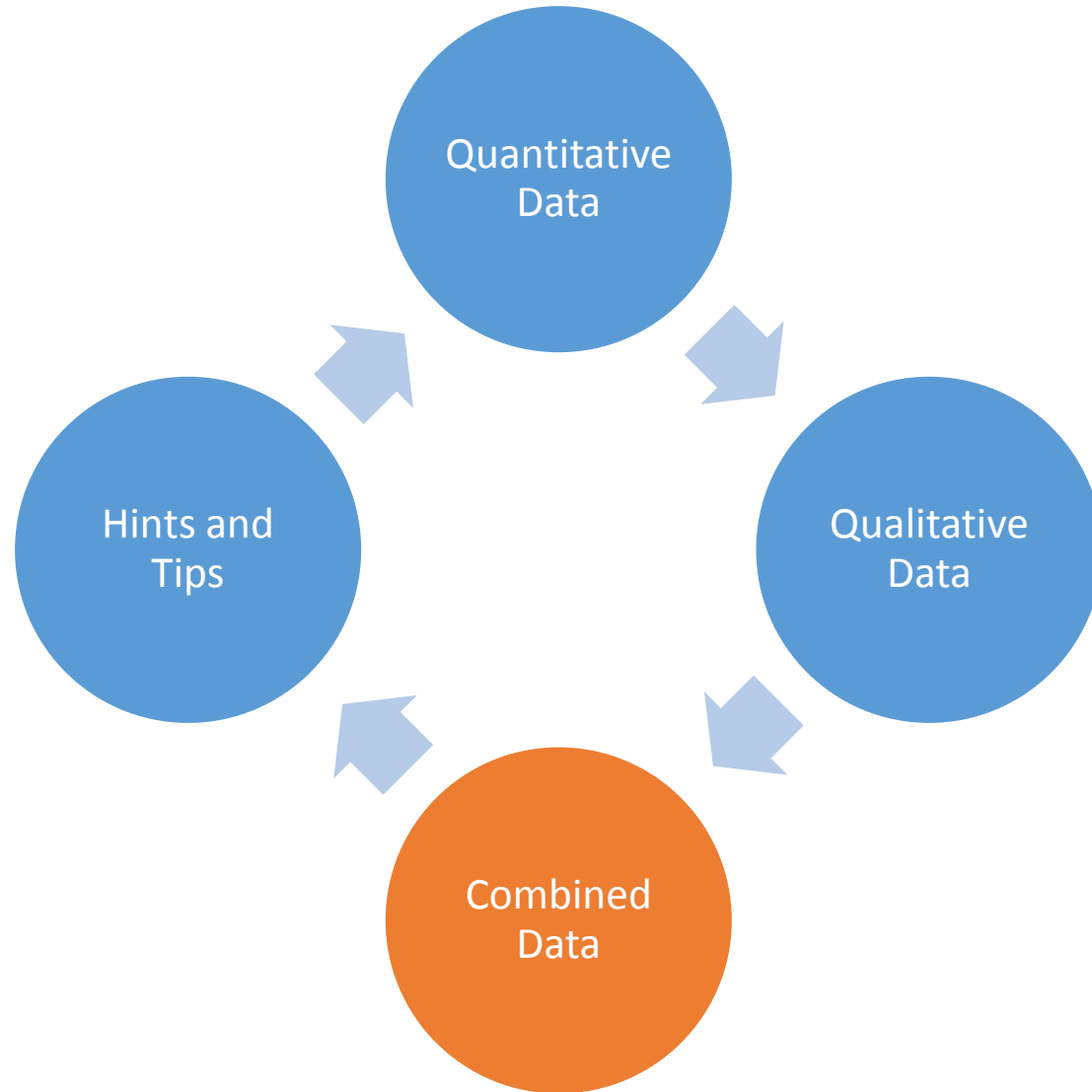
Analysing the data



Analysing the data – Qualitative Data – Themes

- Hard to describe a specific approach for this
- Common themes should be searched for across the data set
- Create tags for data items (e.g. interview notes etc)
- Requires a large amount of data analysis
 - Lots of back and forth (re)work
- Lots of (re)reviewing data to check that everything is covered and correct.

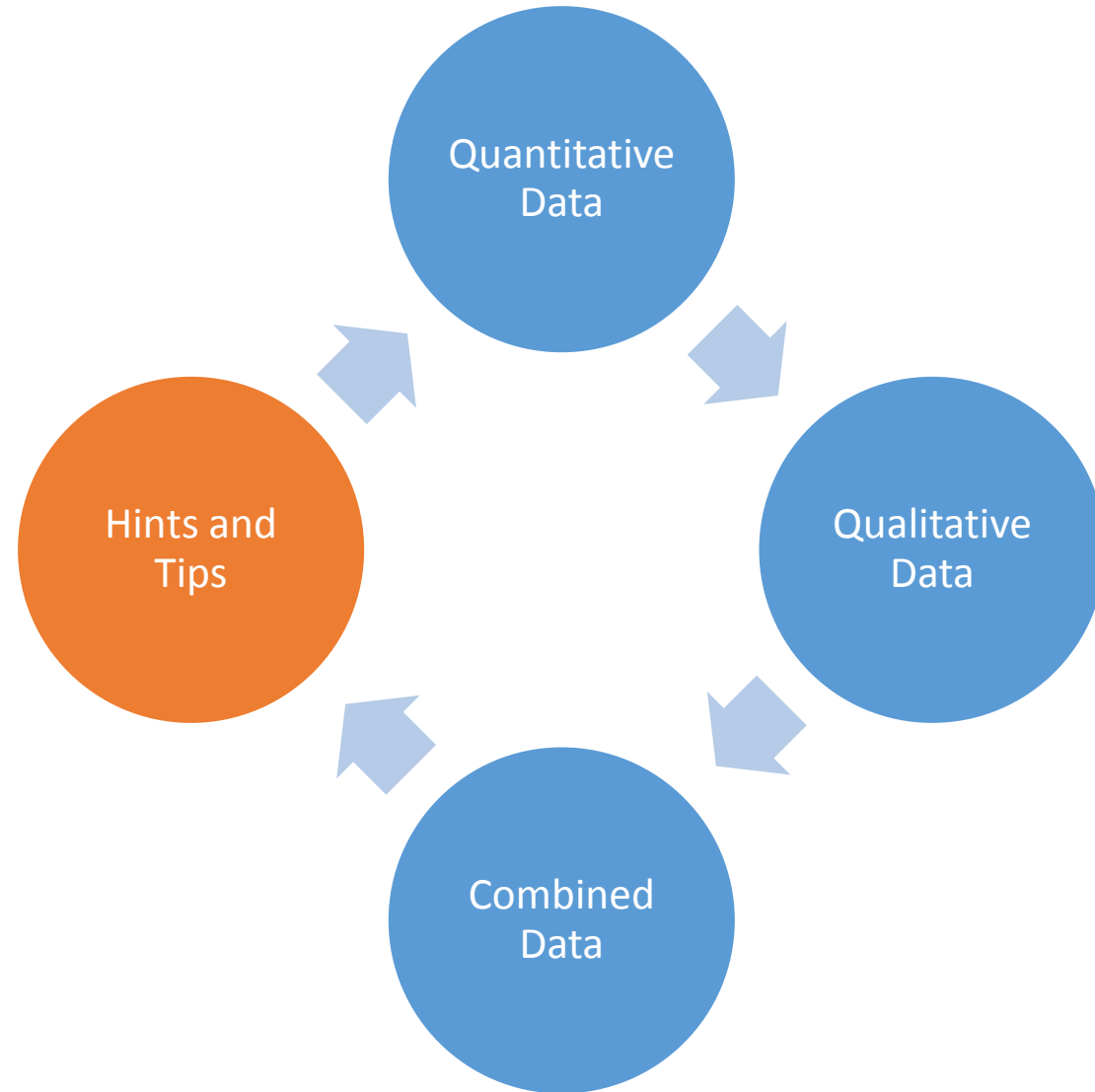
Analysing the data



Analysing the data – Combination of Qual + Quan data.

- The approach really depends on your data
 - Quantitative data (stats) to support initial Qualitative (themes) analysis
 - Or Qualitative themes to support Quantitative stats
 - Or using both data approaches at the same time
- Typical questions?
 - Can themes uncovered during Qualitative assessment be explained or supported by statistical analysis
 - Can any gaps or anomalies in the Quantitative (statistical) analysis be explained or plugged by the Quantitative data
 - Does the Quantitative and Qualitative analysis match or are there major differences?
 - Etc

Analysing the data



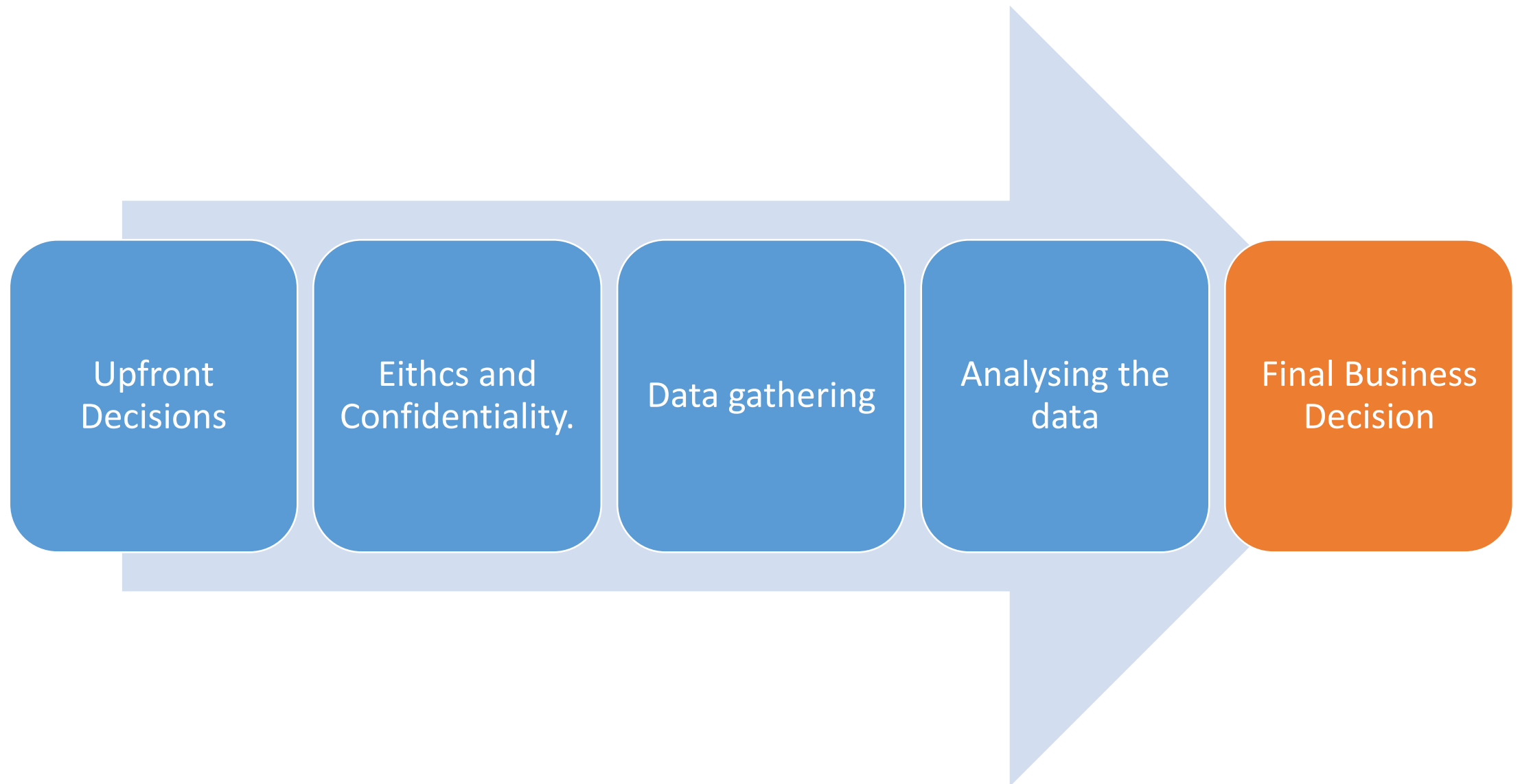
Analysing the data – Problems and other hints/tips.

Tip	Details
Ensure the analysis matches the Research Questions (and, in turn, the Research Objective)	<ul style="list-style-type: none">• It is easy to stray-off course• Although side observations can be useful
Be mindful of previous problems	<ul style="list-style-type: none">• The sample could be wrong?• Participants may not want to help or provide all the data required?• The wrong data may be requested?
Make sure the analysis is as robust and vigorous as possible	<ul style="list-style-type: none">• Using multiple types of data, sources and data gathering methods should help• Check your analysis• Does it make sense?• Is it plausible?• Note any issues, concerns, etc

Analysing the data – Problems and other hints/tips.

Tip	Details
Do not ignore bad or unexpected outcomes (even if it will upset management).	<ul style="list-style-type: none">• This can be challenging (and sometimes frightening)
It is not possible to answer some or all of the Research Questions	<ul style="list-style-type: none">• This is more common than one would think• Need to ensure that this is clearly documented and escalated.
Trying to be too absolute	<ul style="list-style-type: none">• Things are very rarely pure black and/or white• Look at the analysis from different points of view• Create scenarios with %age certainty (plus caveats and assumptions).
Biases <ul style="list-style-type: none">• Personal• Confirmation• Management pressure• Trying to counterbalance	<ul style="list-style-type: none">• Removing these are easier said than done• Using multiple types of data, sources and data gathering methods should help

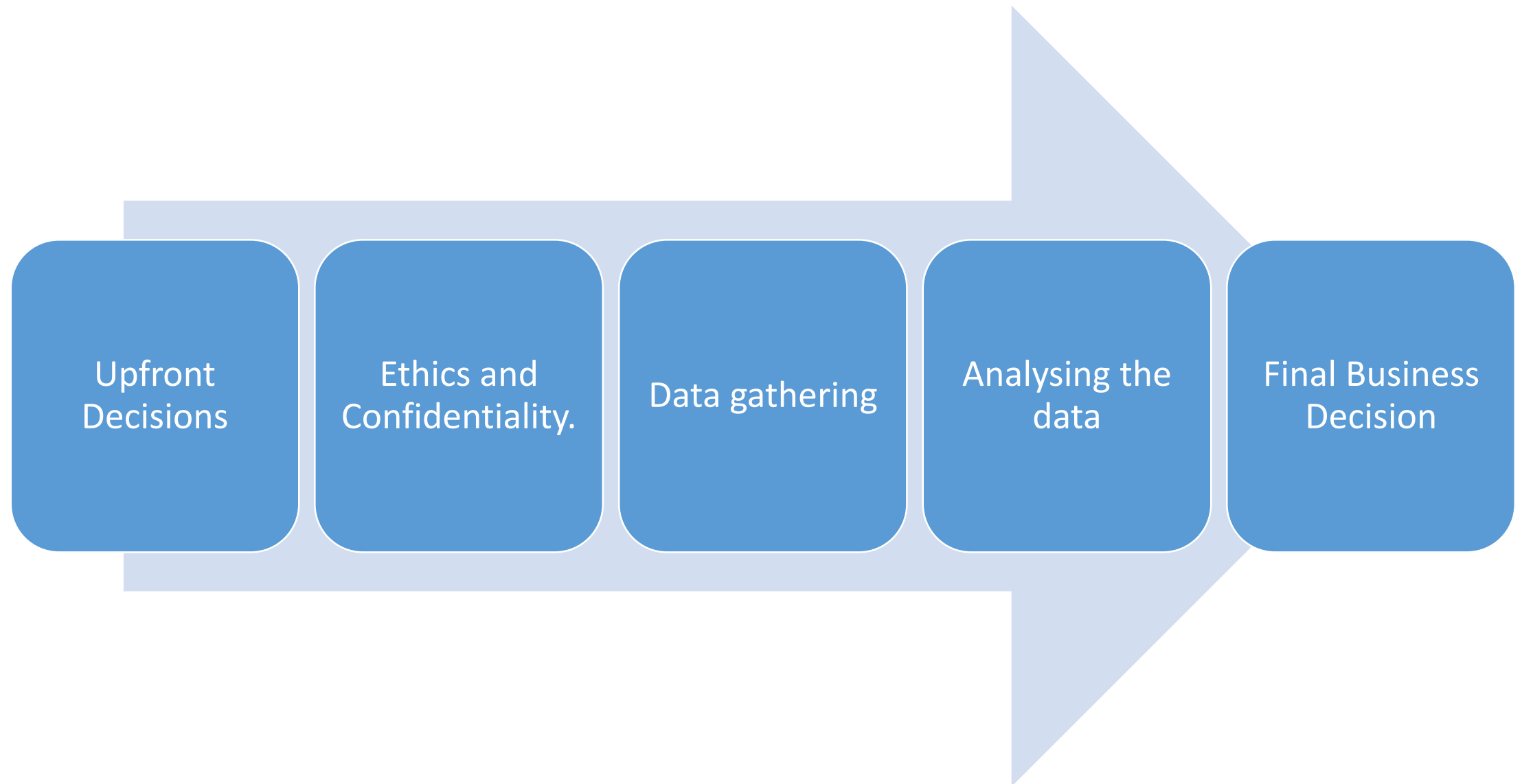
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Final Business Decision

- The approach here is specific to each organisation but a two prong approach is suggested
- Executive Summary
 - List each of the Research Questions and for each question:
 - Has it been answered?
 - Any issues that need to be noted? Eg problems with the sample, gaps in the data, problems with the analysis, other explanations
 - Any further action required? e.g. more research
 - Any 'side observations' discovered
 - A summary of whether the overall Research Objective has been met
- Details of the Research Project
 - The journey followed with details of the sample, data, analysis, etc.
 - This will help explain the issues and problems encountered

Agenda



To Summarise....

Upfront work is required

- Senior forum to oversee
- Ethics and Confidentiality
- Research Objective (and Research Questions) needs to be defined

Data Gathering

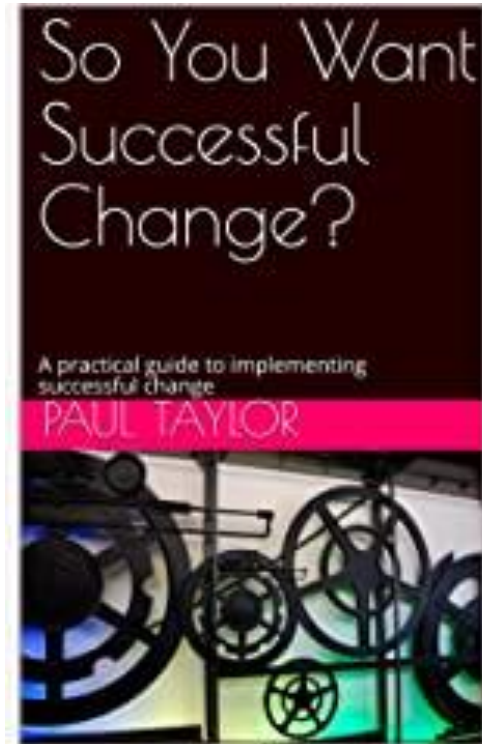
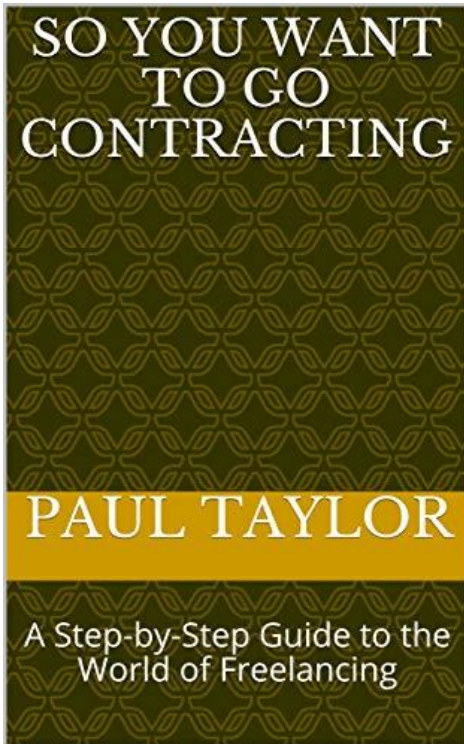
- Qualitative vs Quantitative vs Combination
- Primary vs Secondary vs Combination
- Create a sample of the population to collect data from
- Various different ways to collect the data

Analysing the data

- There are various methods but note advantages, disadvantages and cross check

Final write-up -> Ensure you answer the Research Questions and then Research Objective

Thanks for listening



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