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Using Data Analytics to Fight Fraud and Improper Payments in the NHS

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Analytical Intelligence Lead

Today:

- Introduction to data analytics in the NHS CF environment
- Good news, bad news, the risks and the opportunities.
- The advocated approach – our best practice
- Case studies
- The future

Happy to answer any questions at the end – or contact us!

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The Data

Data – the good news

NHS hold the biggest store of healthcare data in the world.

- Over 55 million patients registered with a GP
- 96% of GP's are set up to allow patient to access details online (NHSX)

A valuable data asset with an estimated worth of £9.6bn per year (Ernst & Young "Realising the value of health care data: a framework for the future" July 2019)

Five year forward plan requires the NHS to be digitally transformed - going paperless by 2020! (Secondary care by 2023)

- 74% of prescriptions are now electronic
- One in ten trusts are now fully digital
- IoT devices allow for multitude of data to be captured

Not just about what appears in plain sight!

- Time stamps of system log on
- Medical devices
- Metadata

Analytics – How important in Counter Fraud?

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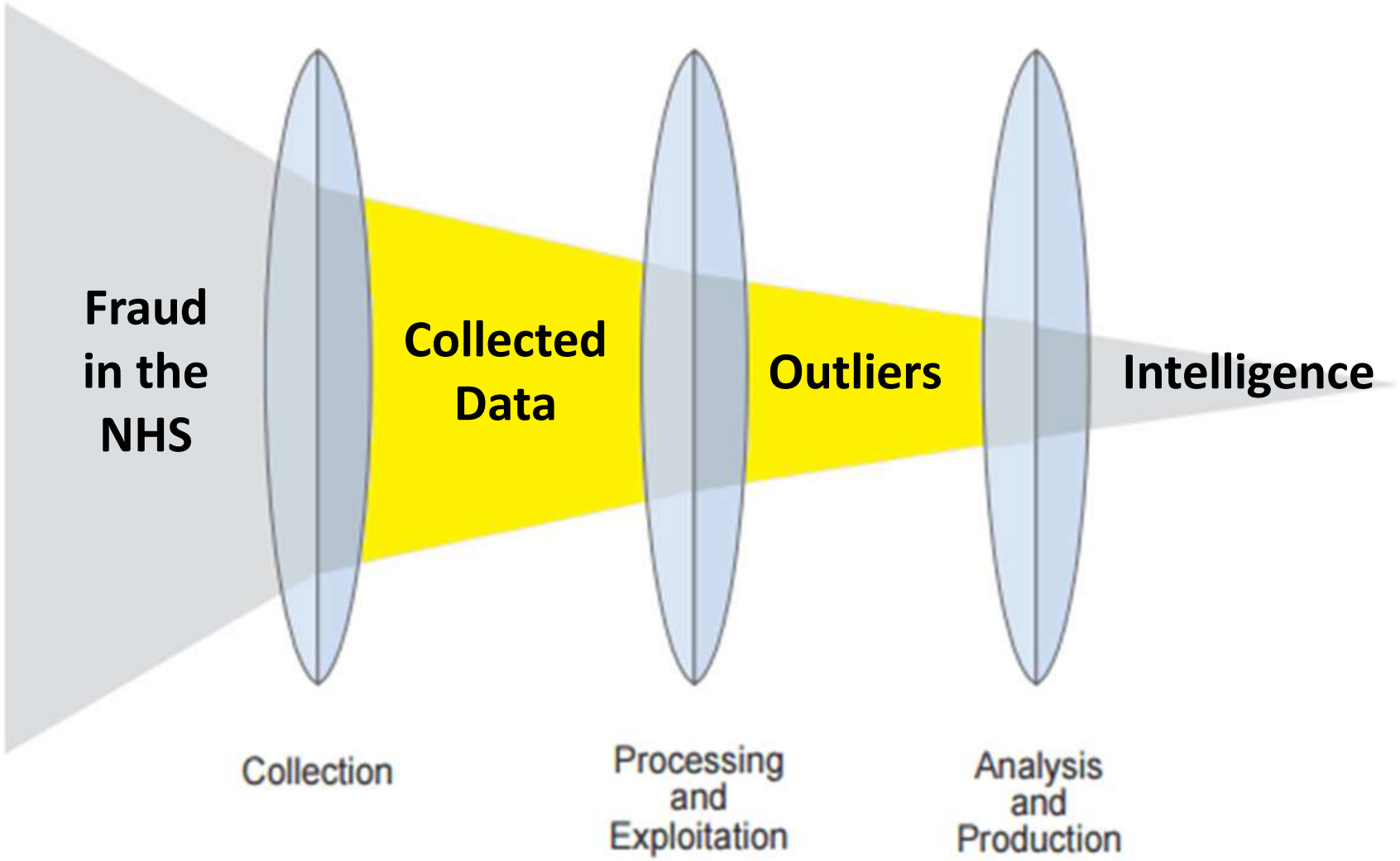
NHS Activity

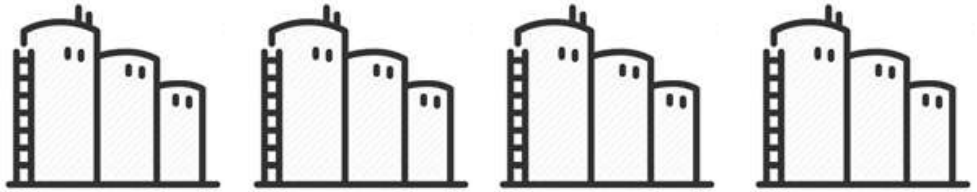


Counter Fraud Activity

- Sanctions
- Identified best practice
- Closing loopholes
- Deterrence
- Recoveries
- Counter Fraud Culture

Data – the bad news

- Silos!



- NHS counter fraud data relates to patients and treatment, making it sensitive personal data with duties of confidentiality (even generic issues like procurement data!)

- The need for expertise and domain experts
  - In terms of local systems and business processes
  - In terms of medical processes and the records behind them

- Transformation – Everyone overlooks it and it's always more complicated than you think!

…and that's before you even get to the analysis itself

Risks of the wrong approach

- “Analysts, analyse!” – untargeted analysis
- Blockages to data access (especially personal data).
- The push to go ‘Big’ immediately and the danger of drowning in data
- Forgetting that analytics is only part of a wider process.
- Hitting the target but missing the point
- The “next step” factor – failing to make findings accessible and/or to influence others to build on your work

Of course the biggest risk is being unsuccessful…

Scale of NHS fraud

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- According to the latest NHSCFA estimate (carried out in 2018) fraud costs the NHS £1.27 billion a year.

- Enough money…
  - To pay wages for over 40,000 staff nurses.
  - To purchase over 5,000 frontline ambulances.
  - To fund 116,000 hip replacement operations.

- Taxpayers' money taken away from patient care.

- NHS Fraud is also a public health issue. Identify fraud risks, for example, might allow…
  - Unqualified clinicians to treat patients
  - A person registering at multiple clinical sites to misuse controlled drugs

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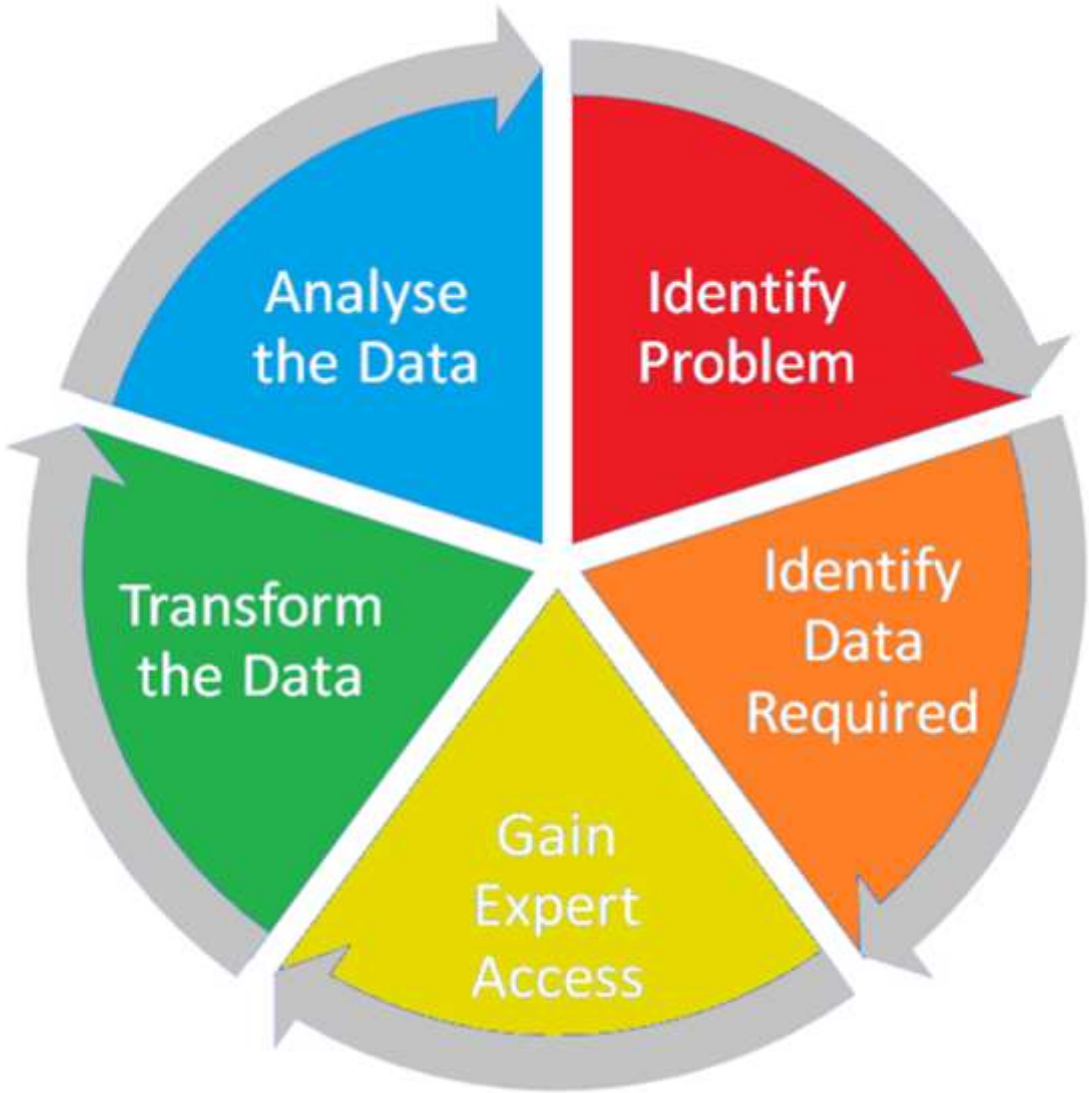
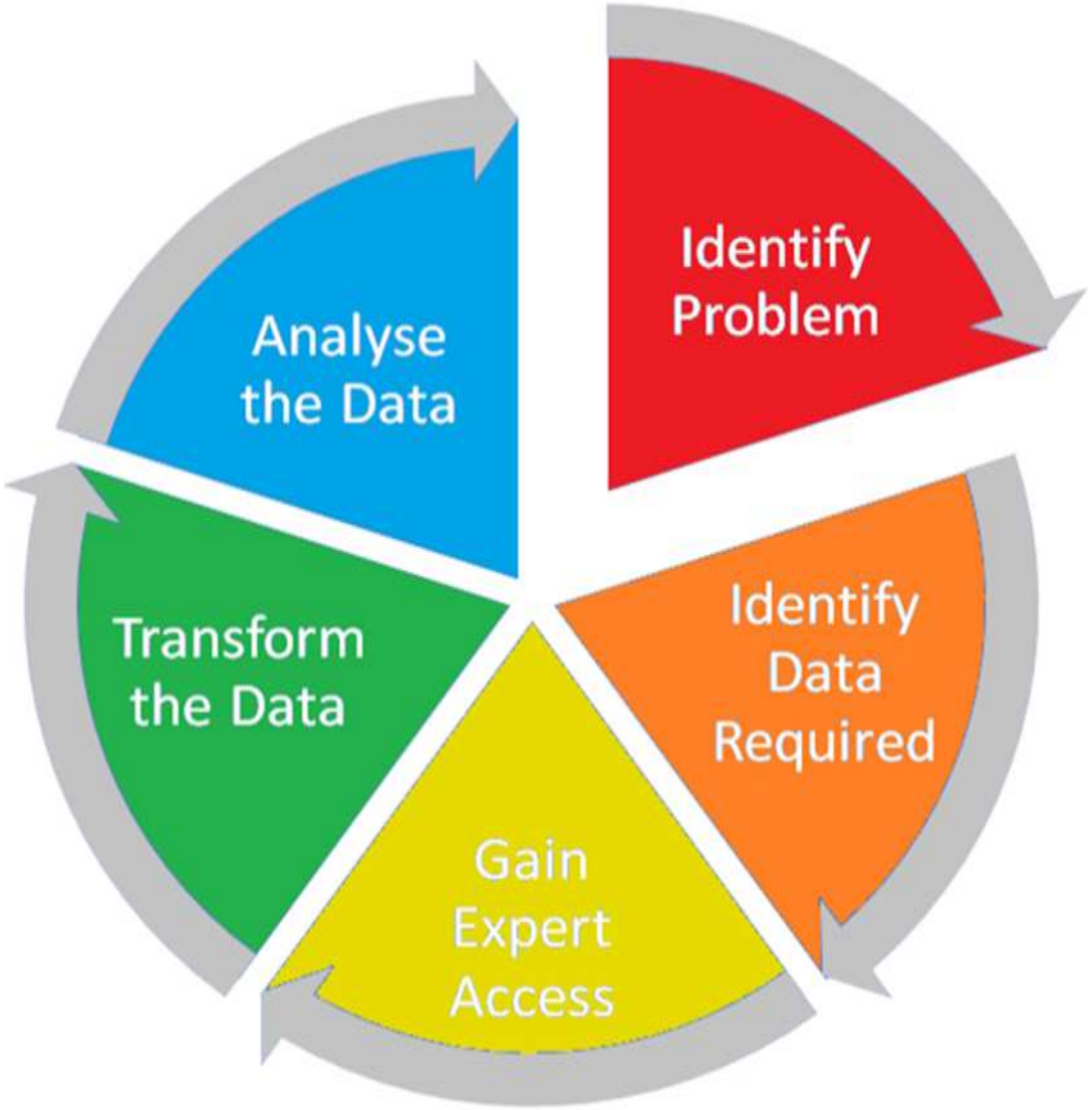
The Analytical Cycle


Analyse the Data
Identify Problem
Identify Data Required
Gain Expert Access
Transform the Data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Starting with the problem

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Historically, “Analysts – analyse!” – results in:

- Analytics without focus
- Issues with data access

Our sources for ‘problems’ -

- Fraud risk assessments (NHSCFA Strategic Intelligence Assessment – “SIA”, thematic assessments etc.)
- Identified Fraud Mechanisms
  - Intelligence reports
  - Case management system data
- Domain knowledge i.e. Expert Access; investigators, clinical experts etc. (see later)

The most effective projects have had the following characteristics:

- Commenced with an individual example of demonstrable fraud
- Started small and were scaled up.
- Made use of local expertise and ownership

No problem? No Problem!

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- Maintain a “Data Analysis Opportunities” document –
  - Data Projects we’re actively pursuing
  - Plan B’s
  - Hypothetical projects – even the bare bones

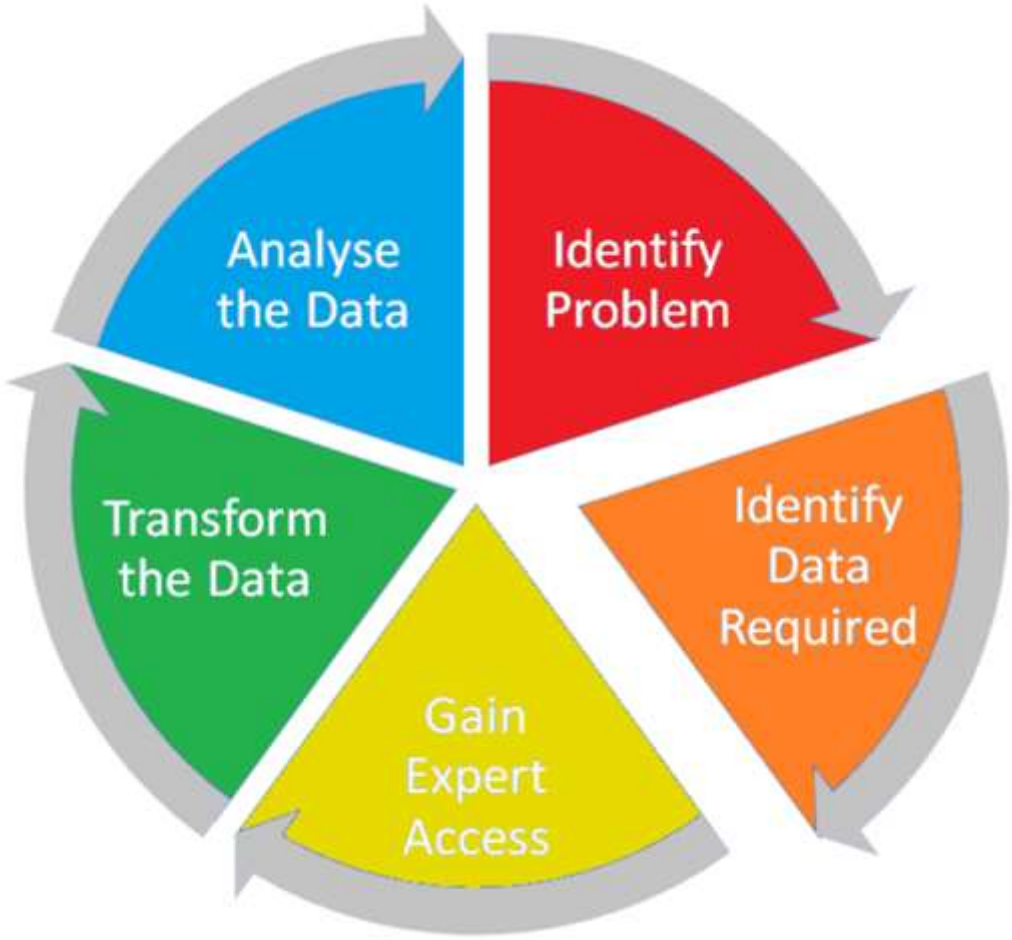
- Record ideas for analysis projects whenever they are identified

- Project creep happens, don’t fight it – embrace it.

  …don’t lose momentum, but don’t lose the idea.

- Giving you time to research ideas proactively at your own pace

- You never know when a Plan B might become Plan A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Use of personal data

- Detecting fraud in a healthcare environment means that NHSCFA could not deliver its function without using sensitive personal data concerning patients, their treatment and the staff providing it.

- This may take a variety of forms, for example:

  - Reviewing dental treatment to identify where dentists split components of treatment claims into multiple treatments to dishonestly maximise profits.

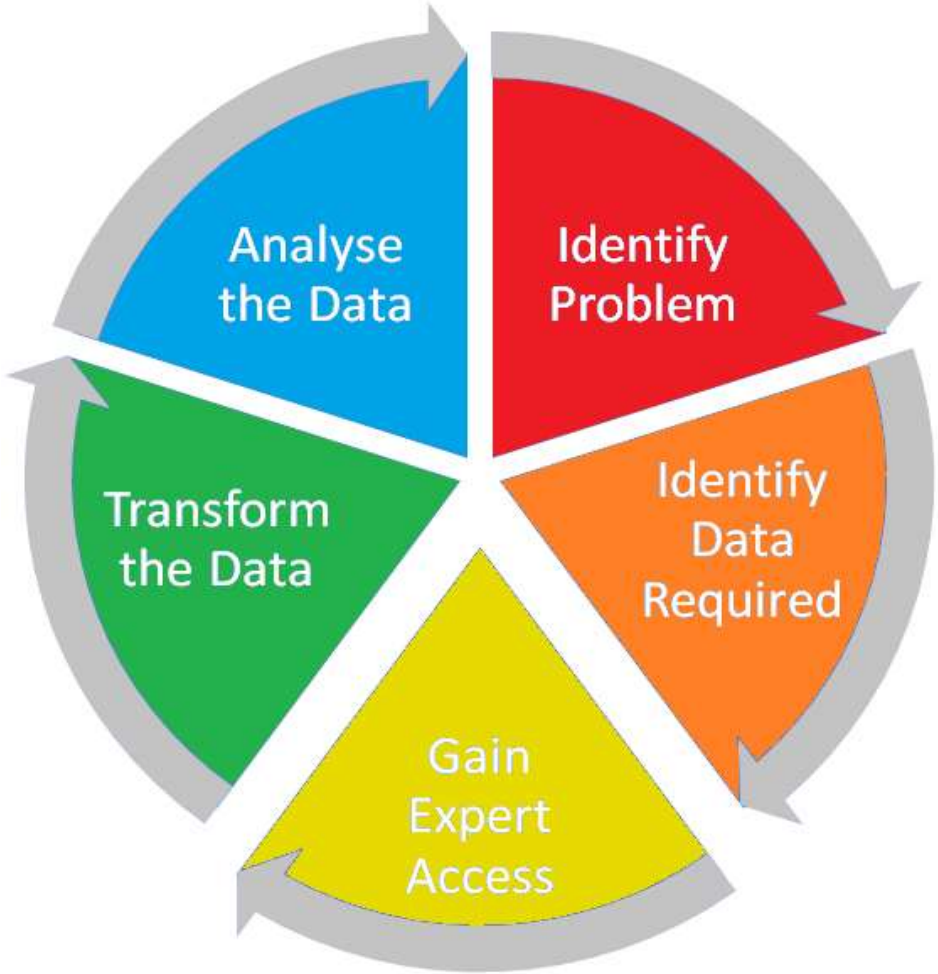
  - Reviewing dental treatments that were being inappropriately coded so as to be upscaled to a higher claim value.

  - Reviewing prescriptions to identify pharmacists claiming for out of pocket expenses on items that they are not eligible for –OR- members of the public claiming for free prescriptions they are not entitled to.

  - Reviewing invoice data to identify agency workers who are duplicating attendance or otherwise abusing the agency system.

Use of personal data (cont'd)

- Does it need to be identifiable?
- Utilise published / open source data.
- Work with the data owners – manage their fears and concerns from the onset.
- Consider using summarised data / samples - "proof of concepts" as a stepping stone to demonstrate the need and proportionality.
- If time is a factor, have an alternative – DPIAs, ISAs etc take time to produce and finalise
- Above all, clarity and transparency.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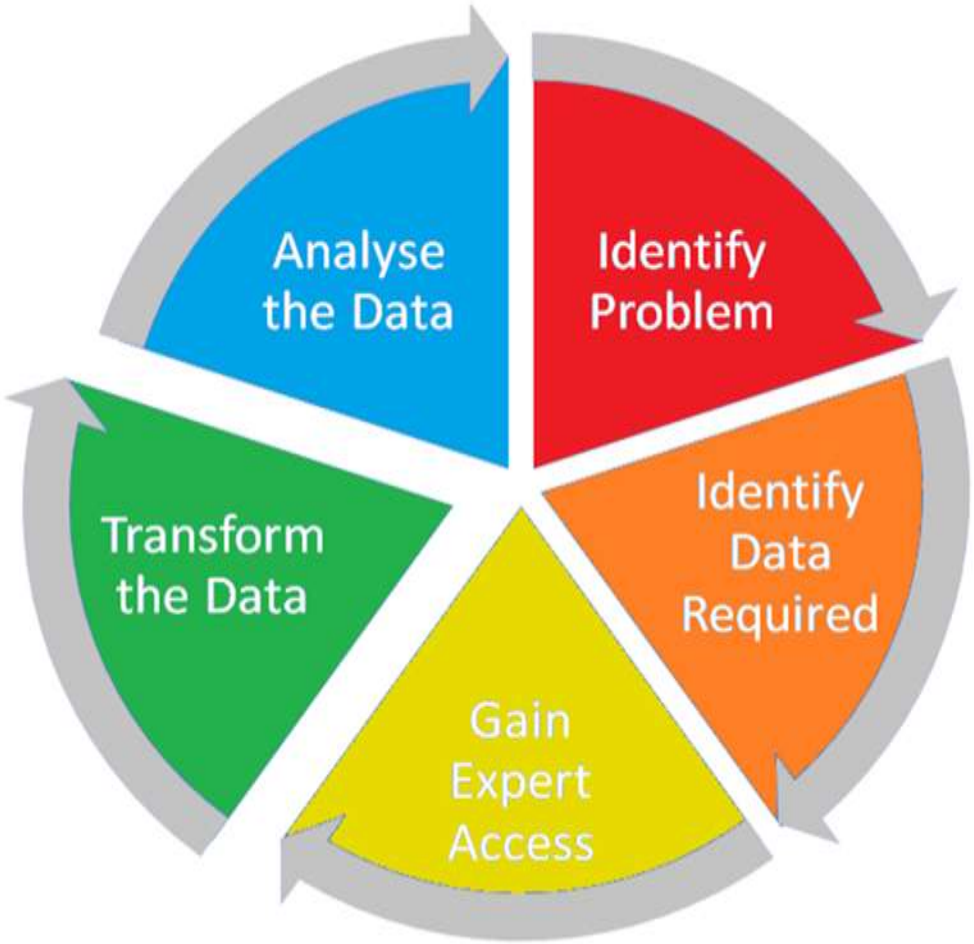
Expertise and Domain Knowledge

- Only an expert…
  - Can tell ‘the story’ of the data
  - Understands the exceptions that prove the rule (there’s always some)
  - Will be able to validate findings and help with understanding what they mean
- The value of sitting in a room together!
- Involving throughout the process prevents unfortunate truths at the end.
- The value of wider collaboration – overlap comes in unusual places
- Useful also in the “next steps” aspect of the project– the changes that can/should be made (the “so what” factor)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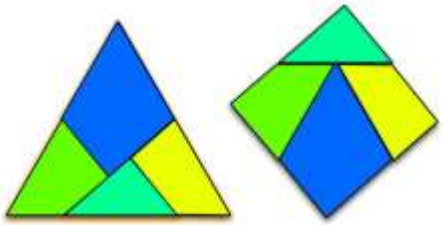
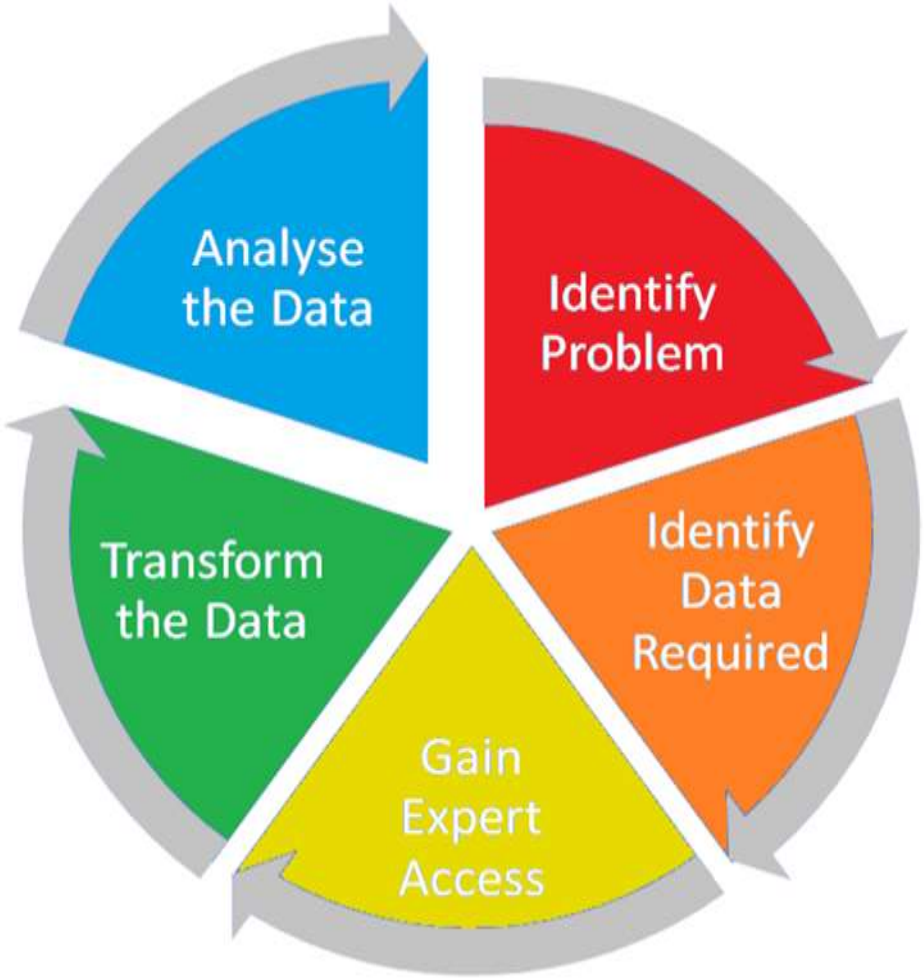
Transformation



- Data is never ‘off the shelf’ ready for analysis.
- Expect:
  - Complications to arise due to size of data and its compatibility with internal software.
  - Additional data management required e.g. data cleansing.
- The provision of data dictionaries in previous projects have proven useful, but experts are better (as per last slide).
- Key People (more experts!).
  - Involve Database Specialists during data acquisition period.
  - Engage with internal and external administrators.
  - Collaborate with the experts in the data – get a SPOC.
- Ensure all parties understand how the data behaves and how it is being applied.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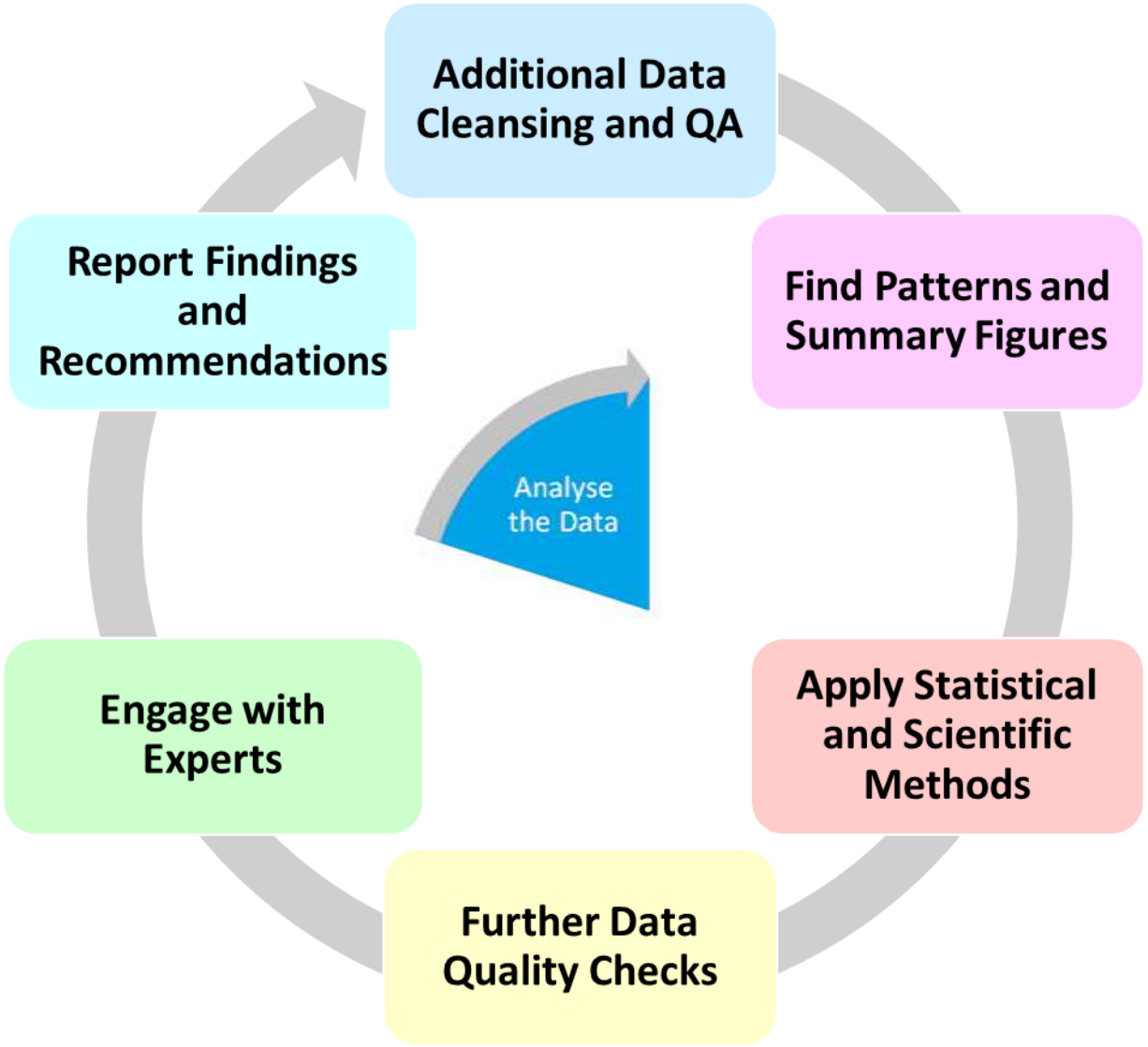
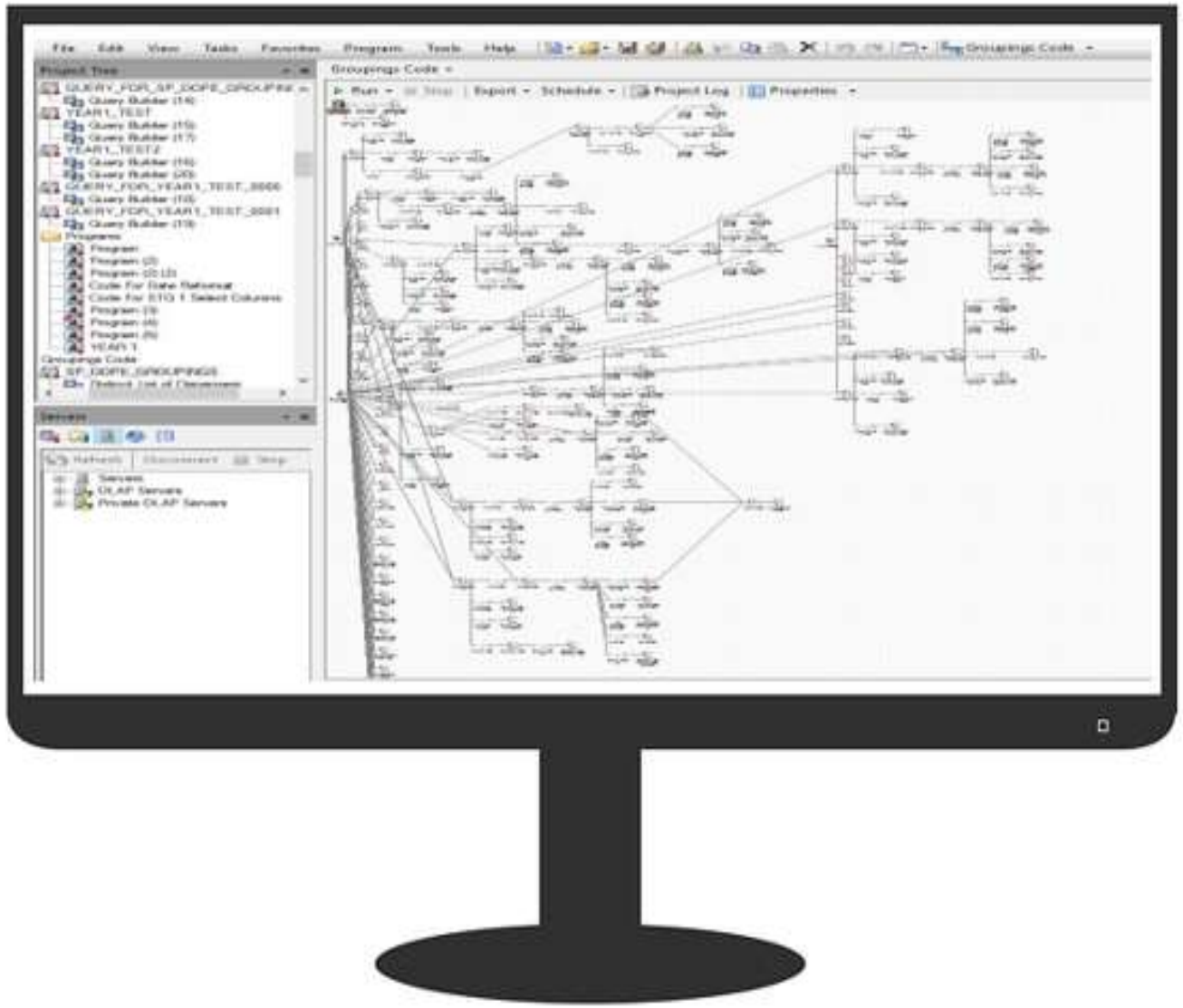

Additional Data Cleansing and QA
Find Patterns and Summary Figures
Apply Statistical and Scientific Methods
Further Data Quality Checks
Engage with Experts
Report Findings and Recommendations
Analyse the Data




Cabinet Office
Counter Fraud Guidance
Best-practice guidance for implementing data analytics to counter fraud in government
Cabinet Office – Fraud & Error Centre of Expertise
Version 1.1
Date 21/05/2018

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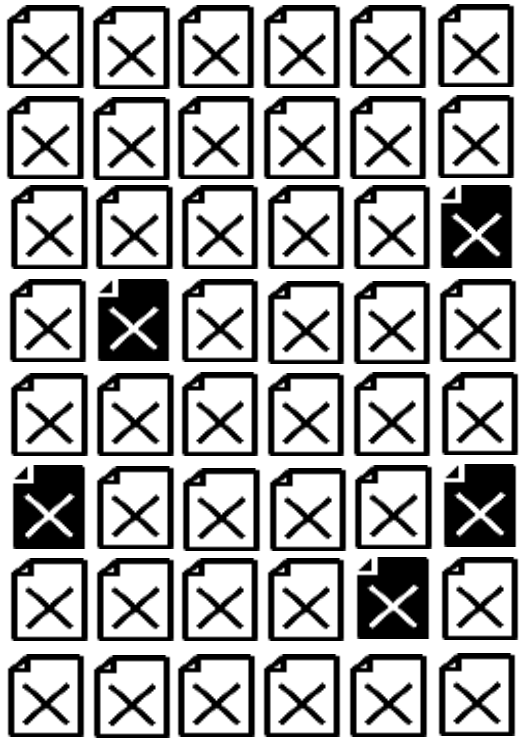
The Findings

Contextual Recognition

- Data is just numbers – what matters is the story behind it.
- Administrative errors and fraud can appear identical on paper.
- Be cautious with using the ‘F word’ (Fraud)
- Outliers need substantiation (and that requires – for now – a human)
- The need for a fraud classifier (especially for aspirations of machine learning)



Application and next steps

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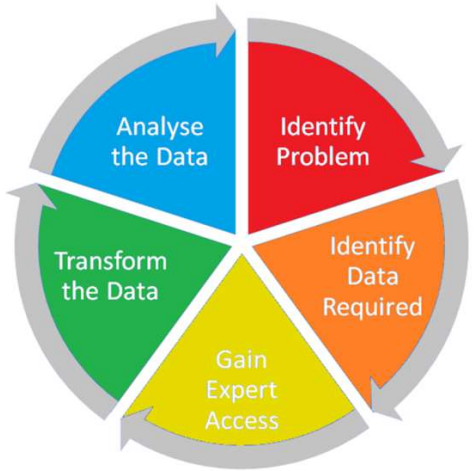
- Make the findings accessible – be clear what it means (and what it doesn't!).
- The "so what" factor – findings should empower next steps.
- Evidencing systems that work is as vital as identifying fraud – share best practice.
- Data that could be fraud because of lack of oversight, but isn't, has its' own place and value.
- Plan to re-measure for changing behaviours
- Feed the cycle.



But when it works…

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Split Treatments

£30.5m

Change in behaviour to date

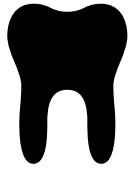
- Issues with proportionality of personal data
- Expert knowledge required
- Samples used to limit personal data usage
- Remeasured annually to monitor behaviours

Invoice

£7m

Fraud risk identified

- Plan B became Plan A
- Local expertise at NHS organisation
- Proof of concept prompting wider work in this area
- Findings weren't fraud, but fraud risk (funds without oversight that could have been fraud)

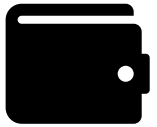


Dental upcoding

£2.5m

Identified potential loss over 5 years

- Started with the problem.
- Expert knowledge required
- Lack of legacy data necessitated replication of behaviour
- Scaled up from single example



Out of Pocket Expenses

14

Suspicious orgs identified

- Used summary data to substantiate need
- Compliment with pharmacist survey (expert opinions(
- Identified system weaknesses and policy weakness
- Fed the cycle - new projects for 20/21

Conclusions

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- Treat data as an asset, but recognise it's limitations alone.
- Commence with the problem.
- Avoid the urge to go big - start small and scale up
- Find your experts.
- Be clear on your legalities for personal data, but also if you even need it
- Be dynamic in managing your opportunities – project creep happens. Don't fight it, record it for a rainy day
- Know what you have when you find it - understand the story of the data (contextual recognition)

Any questions?

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