Accenture Applied Intelligence

THE BRIEF ON DATA POST WORKSHOP PACK

A crash course for student consultants in improving their data literacy

May 2020

Workshop Takeaways

01

That you will have an **understanding** of the conceptual data landscape

02

An **appreciation** of the different approaches and tools that can be used on data

03

That you have increased **confidence** in creating meaningful and accessible insights from data

04

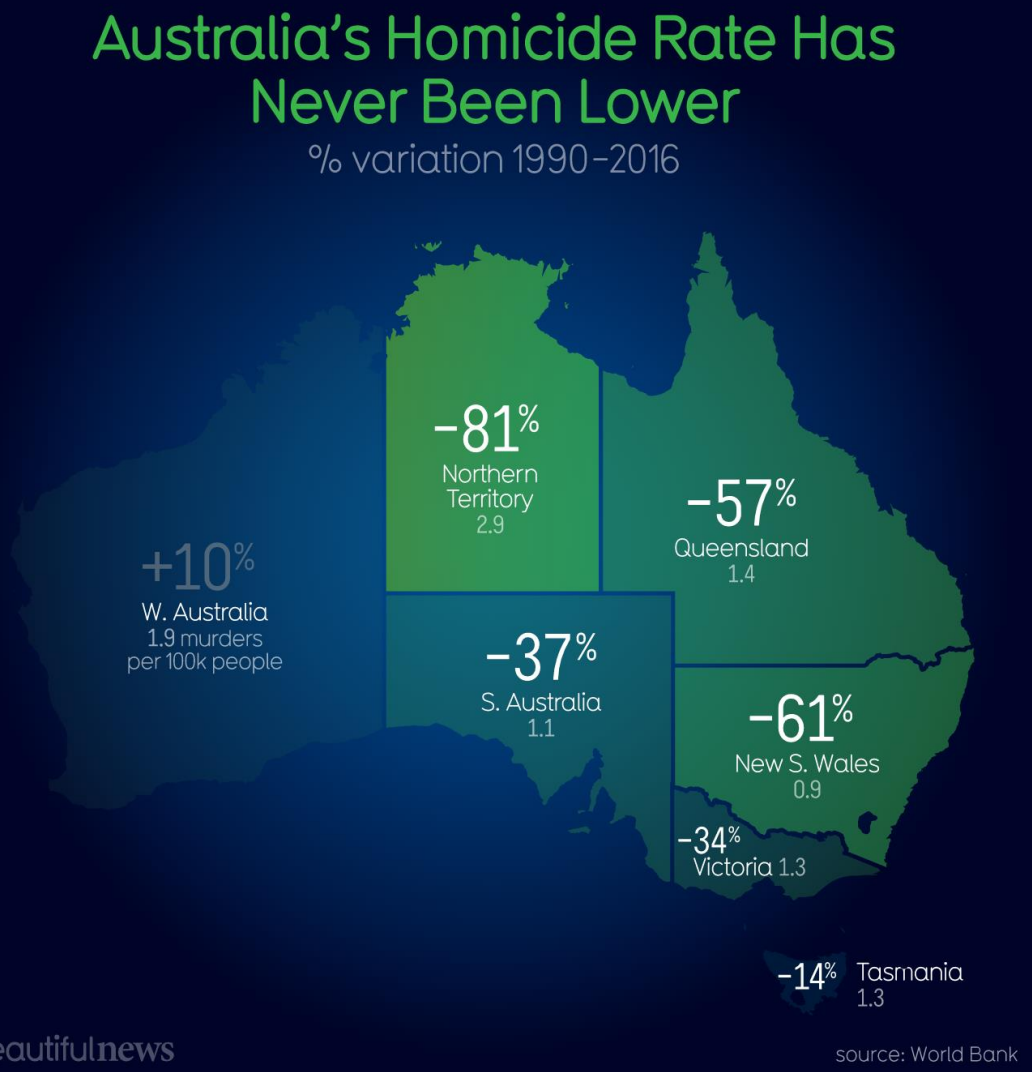
That you know where you lie on your journey and you know **what is next for you and data**

CHANCES ARE, THERE IS SOMEONE BETTER THAN YOU

What inspires me to keep working with data (1)

I get excited when data is presented in **immediately engaging ways** that also are **thought provoking before first glance**.

This is the careful combination of **human centred design** with **storytelling through data**.



What inspires me to keep working with data (2)

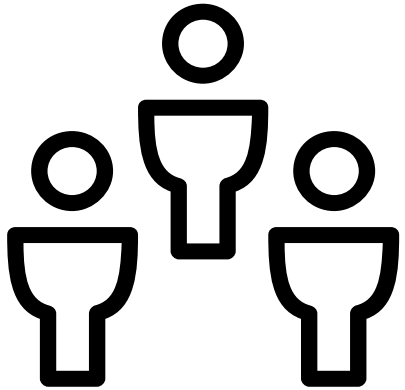
The battle of Midway in June 1942 was one of the most important Naval battles in history.

The United States were outnumbered by the Japanese yet prevailed through the use of military intelligence, led by Edwin T. Layton, to partially decode Japanese messages and detect patterns in these messages to create meaning.

This was dramatized in the 2019 movie titled ‘Midway’. **Data collection, pattern finding and presentation was key for success.** A detailed analysis can be found here.

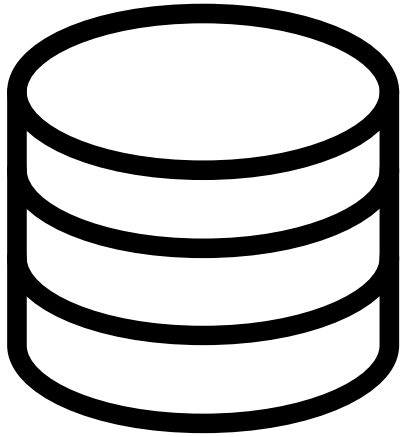
What inspires me to keep working with data (3)

People



Data has the ability to liberate people. Not enslave people to it.

Data

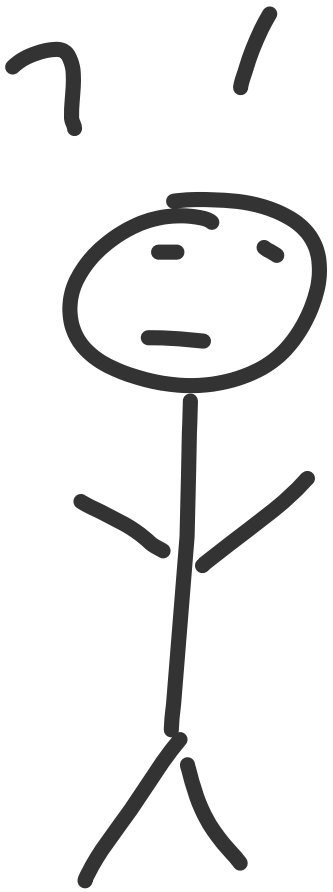


Has the capability to provide guidance and truth in some cases were there is none.

BUT WHERE DO WE BEGIN?

Imagine a day in your life without data

1. You wake up – only to discover that the alarm on your phone is not working. More to that, you don't know what time it is.
2. You realise that your phone is seemingly not working at all, you decide that this is a problem that you'll have to fix later today.
3. After looking at the sun to discover that it is still morning (hopefully) you decide to wait for the bus to get to university. You wait an extraordinarily long time, it really is one of those days.
4. To make it worse, your Smartrider doesn't work. Guess cash wasn't pointless at all.
5. You get into university finally after what seems like an eternity after not being able to listen to music from your phone.
6. You get to class, only to discover the doors don't unlock.
7. You mange to find someone and you ask them what is going on. To your amazement, the world has shutdown because of a large-scale cybersecurity attack.



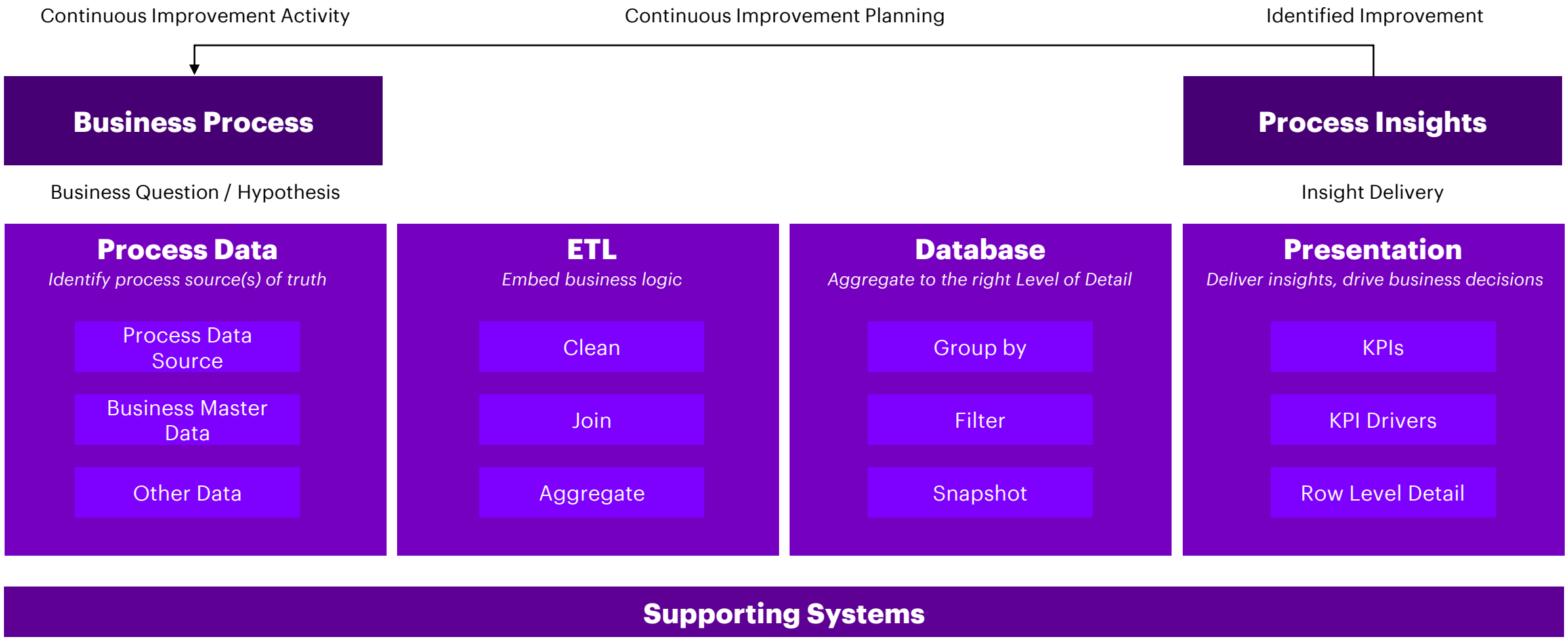
Information is the oil of the 21st century, and analytics is the combustion engine

Peter Sindergaard
Senior Vice President, Gartner Reaearch

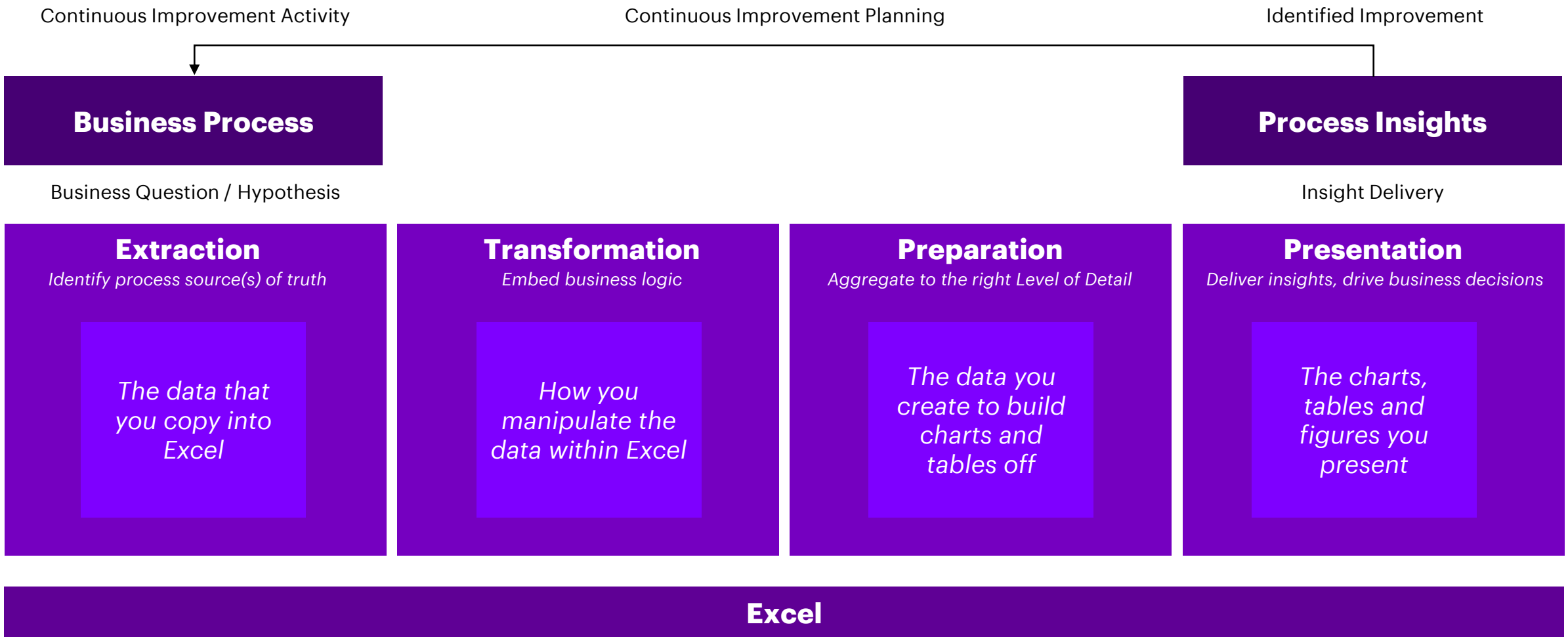
EVEN THOUGH IT MAY NOT SEEM IT, DATA IMPROVES OUR LIVES.

WHERE DOES DATA COME FROM?

The Data Pipeline



The Data Pipeline (for Excel)



What tools should you use?

Aim to use tools that are free (open source) or are widely used. Look not to specialise in tools but to understand the approaches that are used agnostic of tools.

Essential:

Excel – for Simple Data Storage, Simple Transformation and Simple Presentation

Recommended next steps to grow your skills:

SQL – Data Storage and Simple Transformation

Python – Data Transformation and Simple Presentation

R – Data Transformation and Simple Presentation

PowerBI – Simple Data Transformation and Presentation

There are many more tools you can choose from… **There is always going to be a cost to learn a new tool but question is the benefit of this really worth the effort?**

CASE STUDY

COVID-19 - Case Study

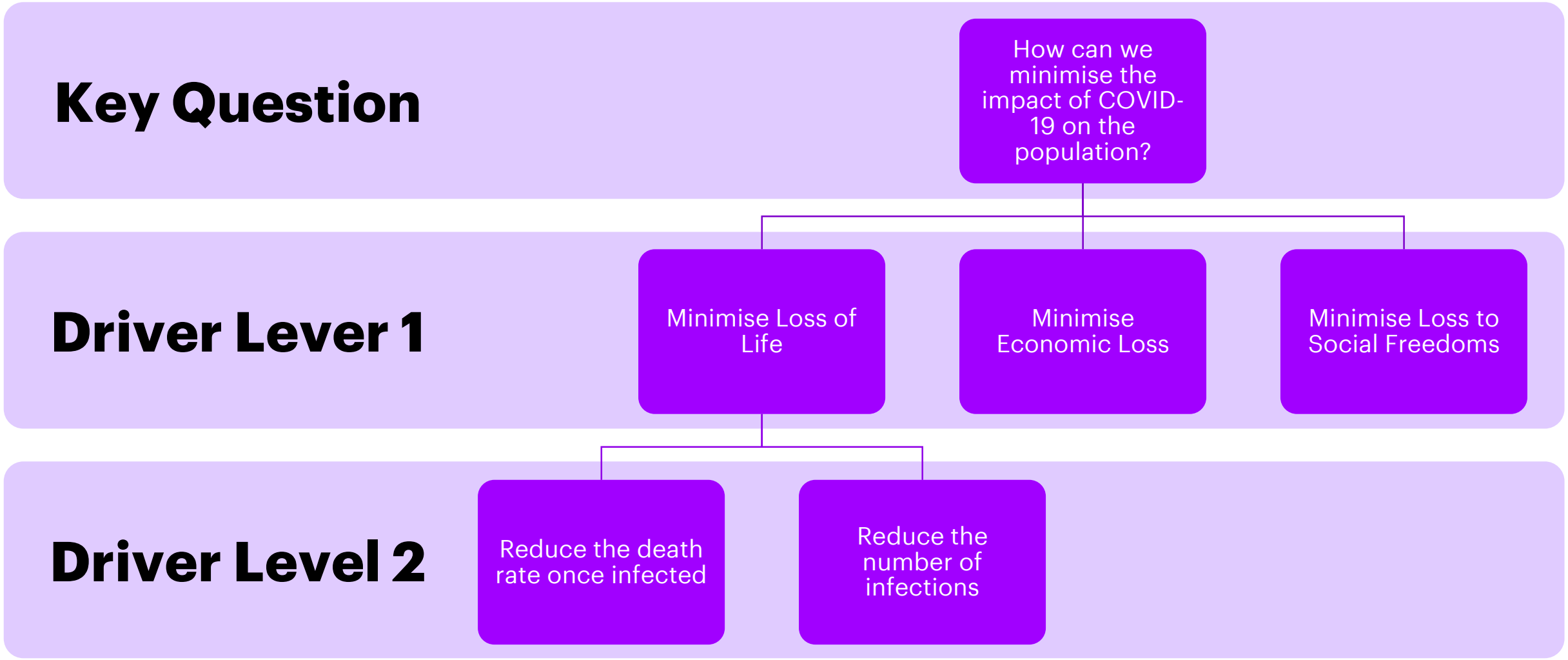
COVID-19 (coronavirus) is a virus that impacts the respiratory system. The virus was first detected in Wuhan, China in December 2019.The virus subsequently spread internationally. Following this the World Health Organisation (WHO) called the virus a pandemic on the 12th March 2020. Information is difficult to source, but the death rate appears to be between 2-10% for those infected depending on local circumstances. The virus has an incubation period of up to two weeks meaning it is difficult to track new infections due to transmission in the asymptomatic stage.

There are two agreed methods to handle virus outbreak to minimise its impact, herd immunity and curve flattening. Australia and its states have decided to pursue curve flattening in its approach to allow for time for vaccines and other treatments to be developed to reduce the impact of the virus. In doing so the hope is that the healthcare system will not be overloaded which may lead to additional deaths.

In order to achieve curve flattening, the Australian and state governments have implemented social distancing measures implemented in increasing severity from March 14th through to April 1st 2020. **The Australian and Western Australian CMO (Chief Medical Officer) have tasked you with preforming an analysis to see if the measures have been effective based on current data available.**

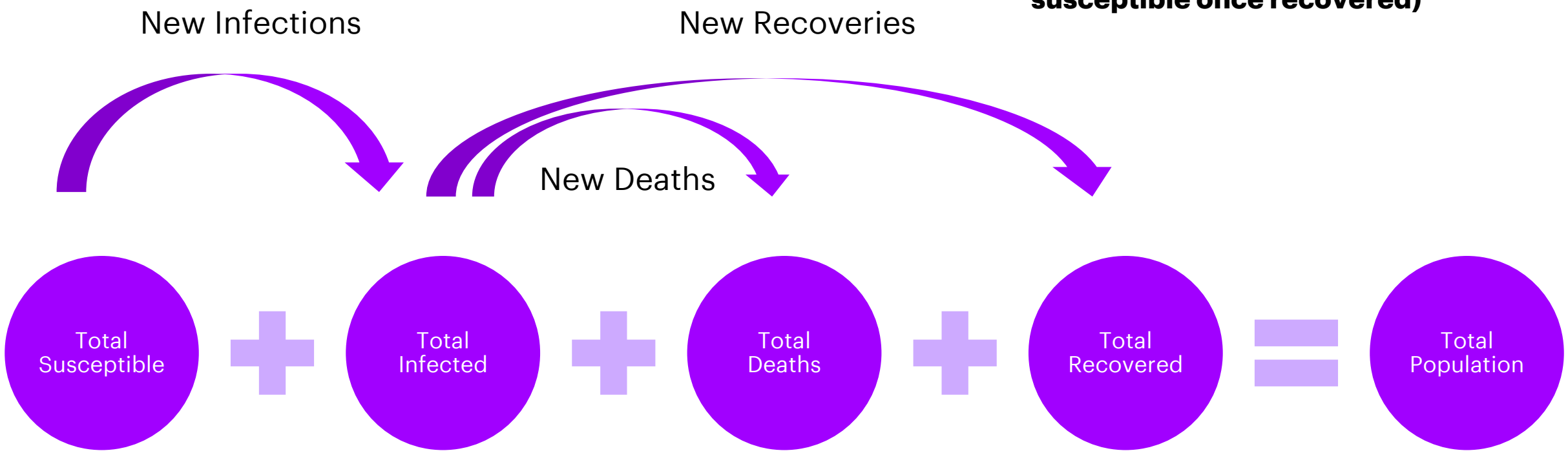
Hospital capacity may be of concern, in WA this is estimated to be at 70,000 beds. For simplification, assume the virus impacts everyone the same (i.e. everyone with the virus must be hospitalised).

So what is the question that our client is seeking to answer and what is this logically?



Domain Knowledge – SIR Modelling

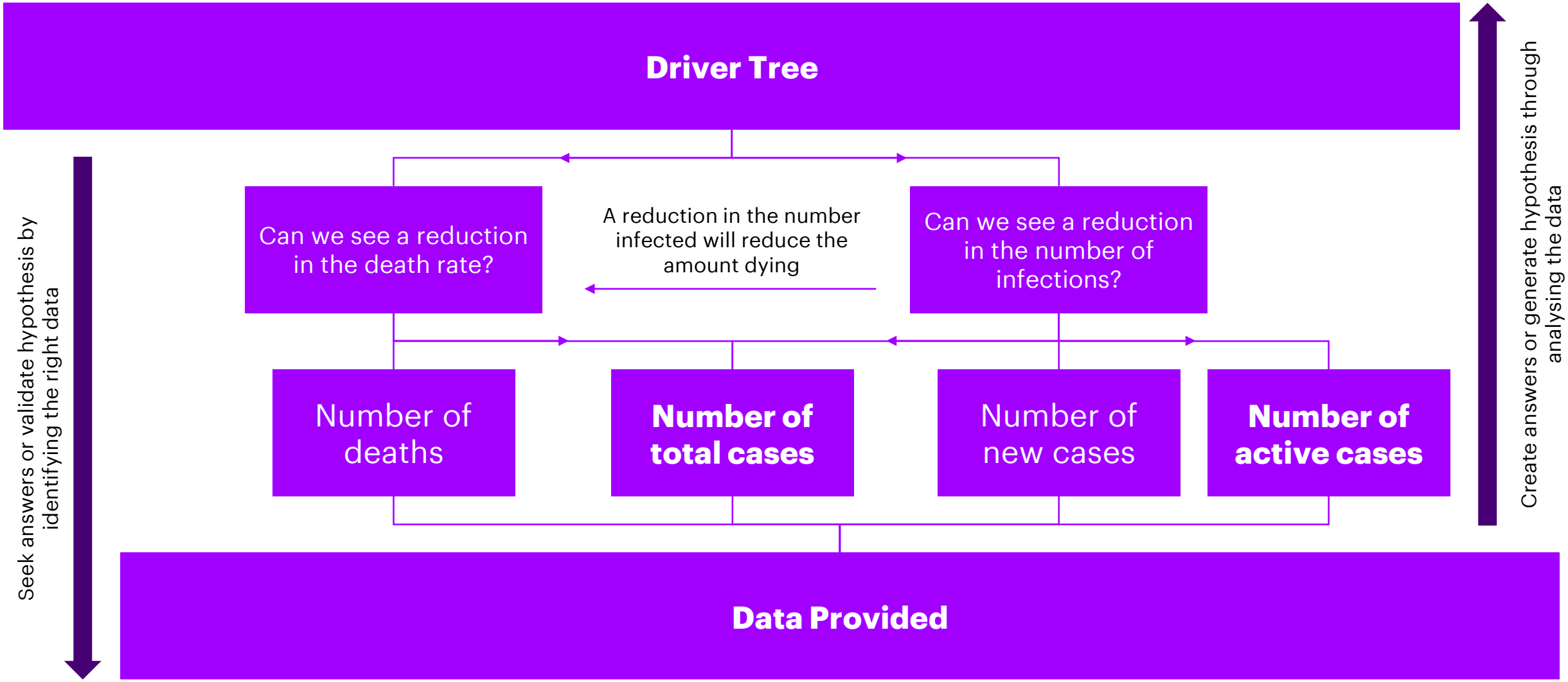
For simplification, please assume that those who have recovered can not get the virus again (i.e. they are not susceptible once recovered)



New Infection Rate (i.e. % of People who are likely to be infected) is dependent on the amount of people who are susceptible, the number of people who are currently infected and the success of measures in minimising the spread of the virus (i.e. social distancing between susceptible and infected people)

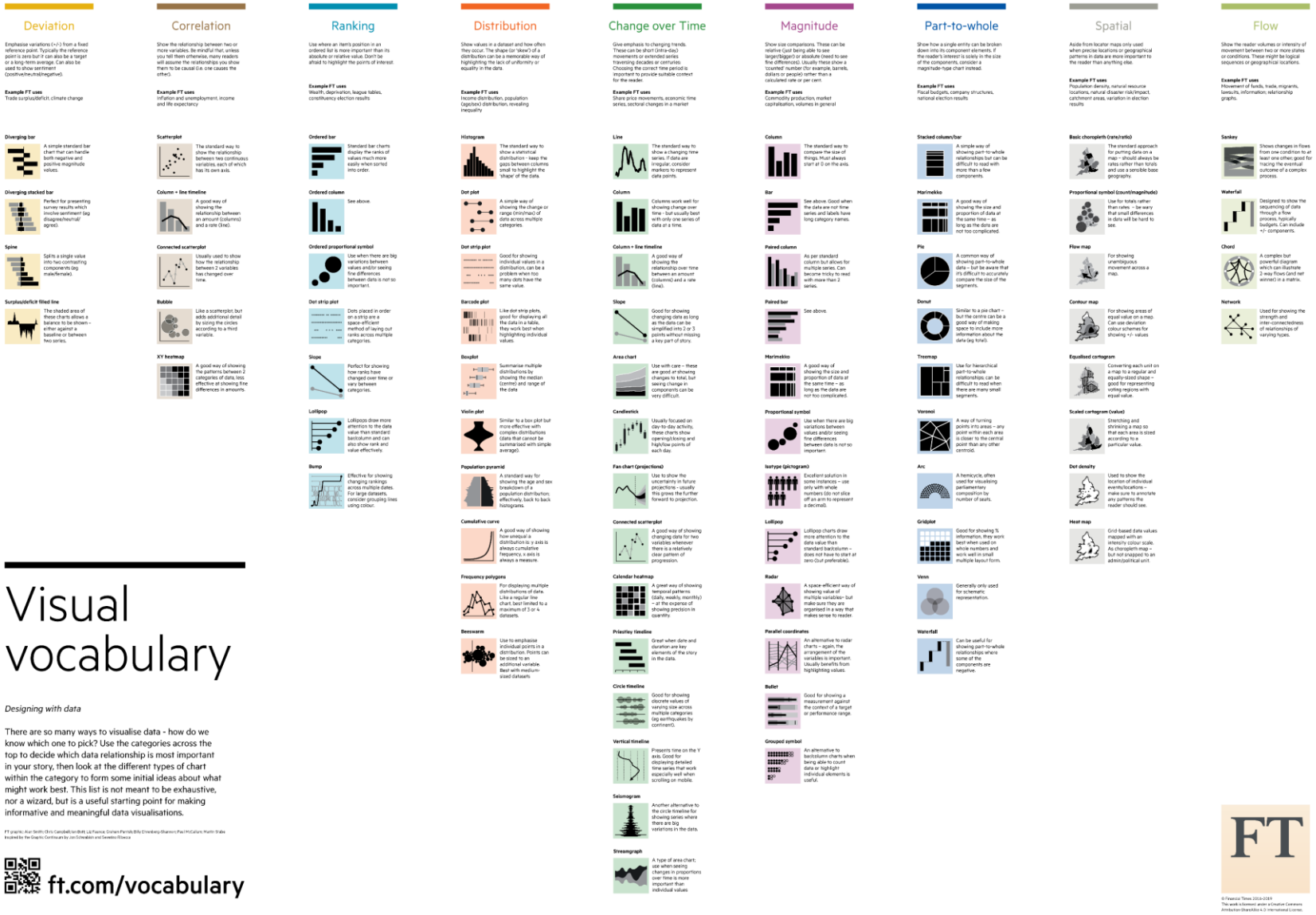
Recovery Rate (i.e. % of People who will recover if infected) is dependent on environmental conditions including the quality of healthcare available to treat those with the virus. **Death Rate** is the inverse of this (i.e. as Recovery Rate increases Death Rate decreases)

Top Down and Bottom up Analysis



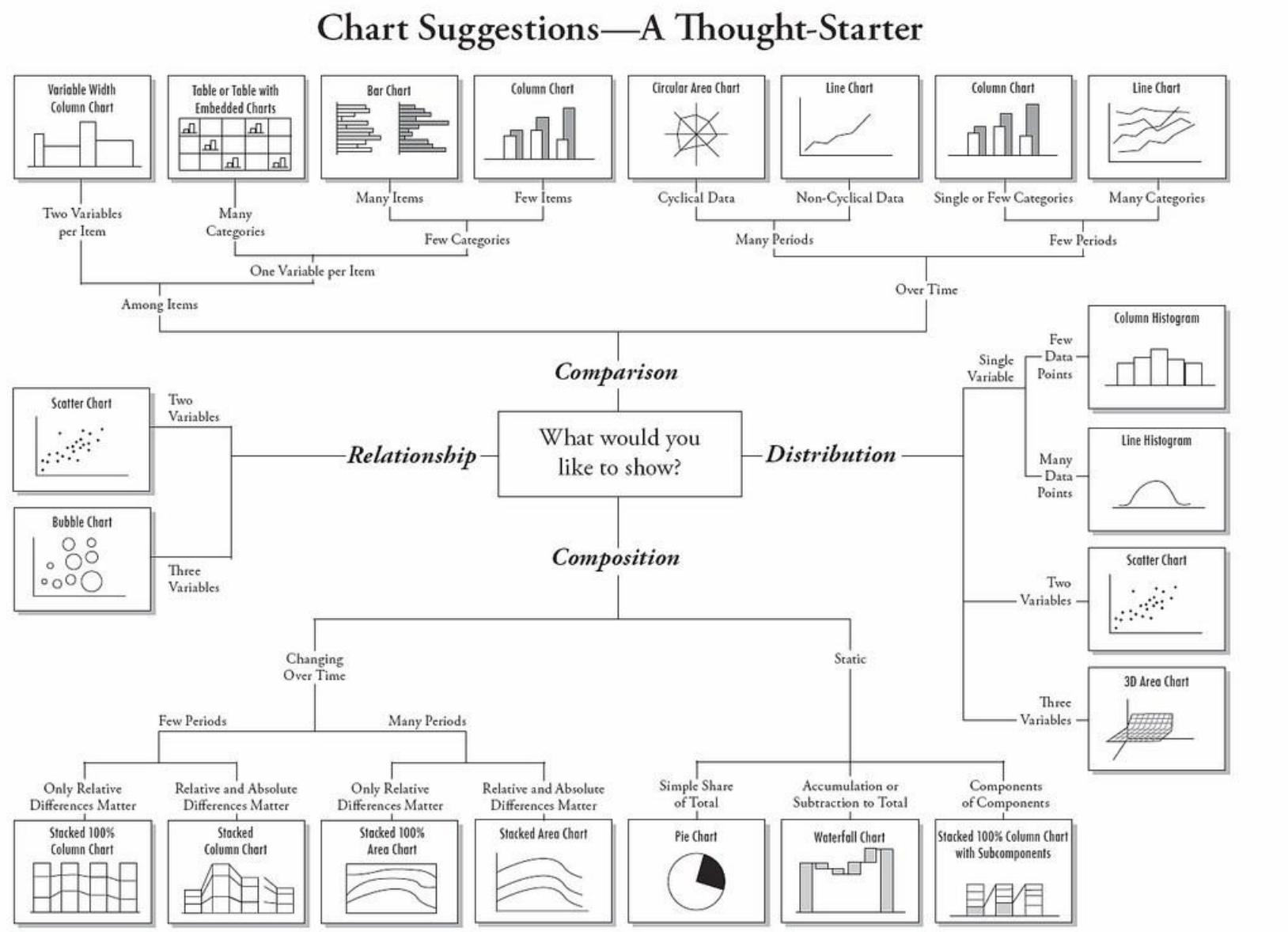
WHAT CHART WOULD WORK BEST TO PROVIDE INSIGHT?

So you've got the data you want – how do you present it? (1)



More details here

So you've got the data you want – how do you present it? (2)



WHAT IS THE BEST WAY TO PRESENT OUR FINDINGS?

But what does the user want to see?

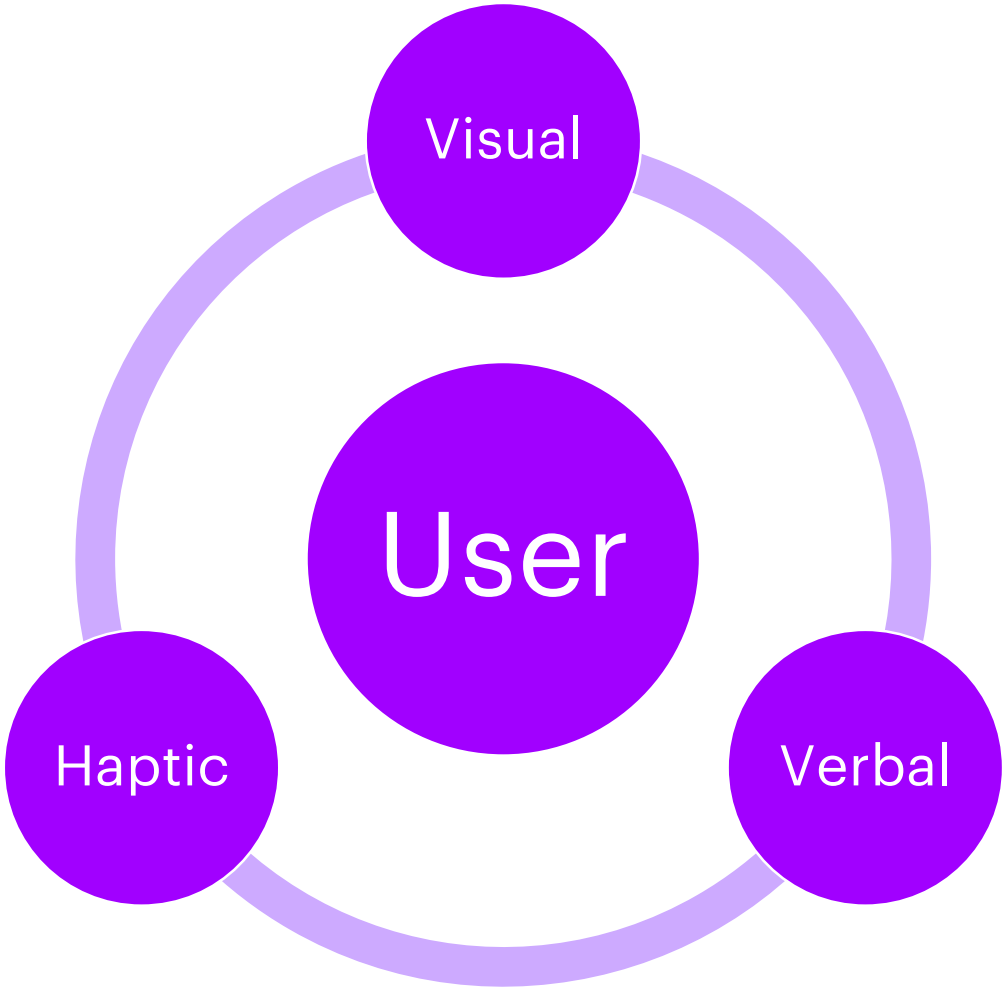
Augmented Insights is the field of analytics that focuses on the presentation of data in the best way possible for consumption for the end user

Remember when you were in primary school, you learnt things in one of the following ways:

- Visually – learning through seeing
- Verbal – learning through communicating
- Haptic – learning through interacting

Think about this, you likely have a preference for how you learn. It may not just be one of these ways but a combination.

In the same way, when we present data we must consider how our end user(s) best learn from the data and build the best insight delivery mechanism for them

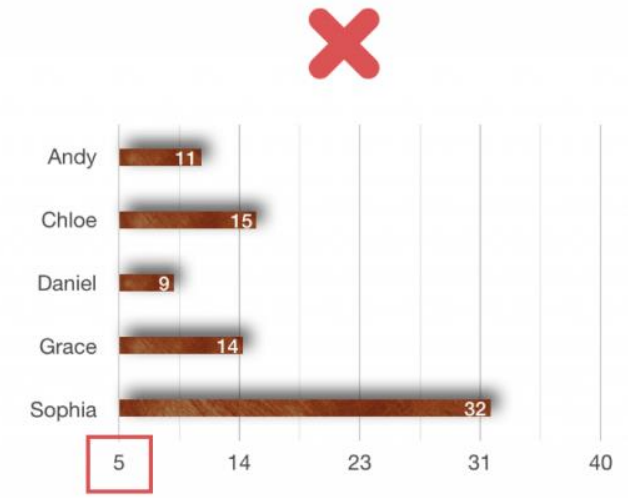


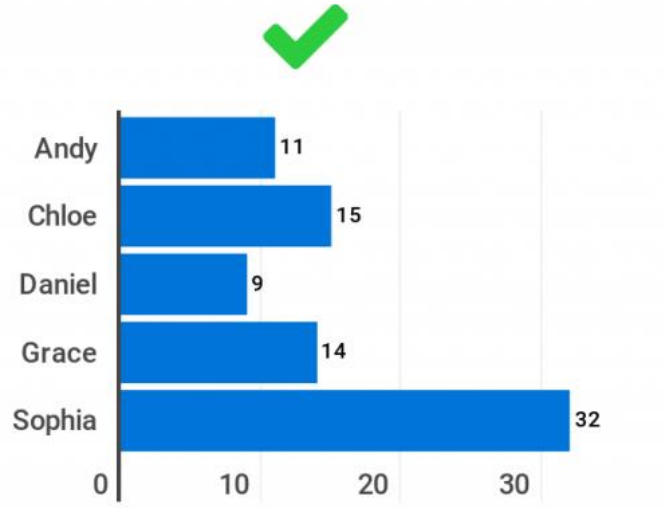
HOW MIGHT WE MAKE THIS EVEN MORE ENGAGING?

All the small things...

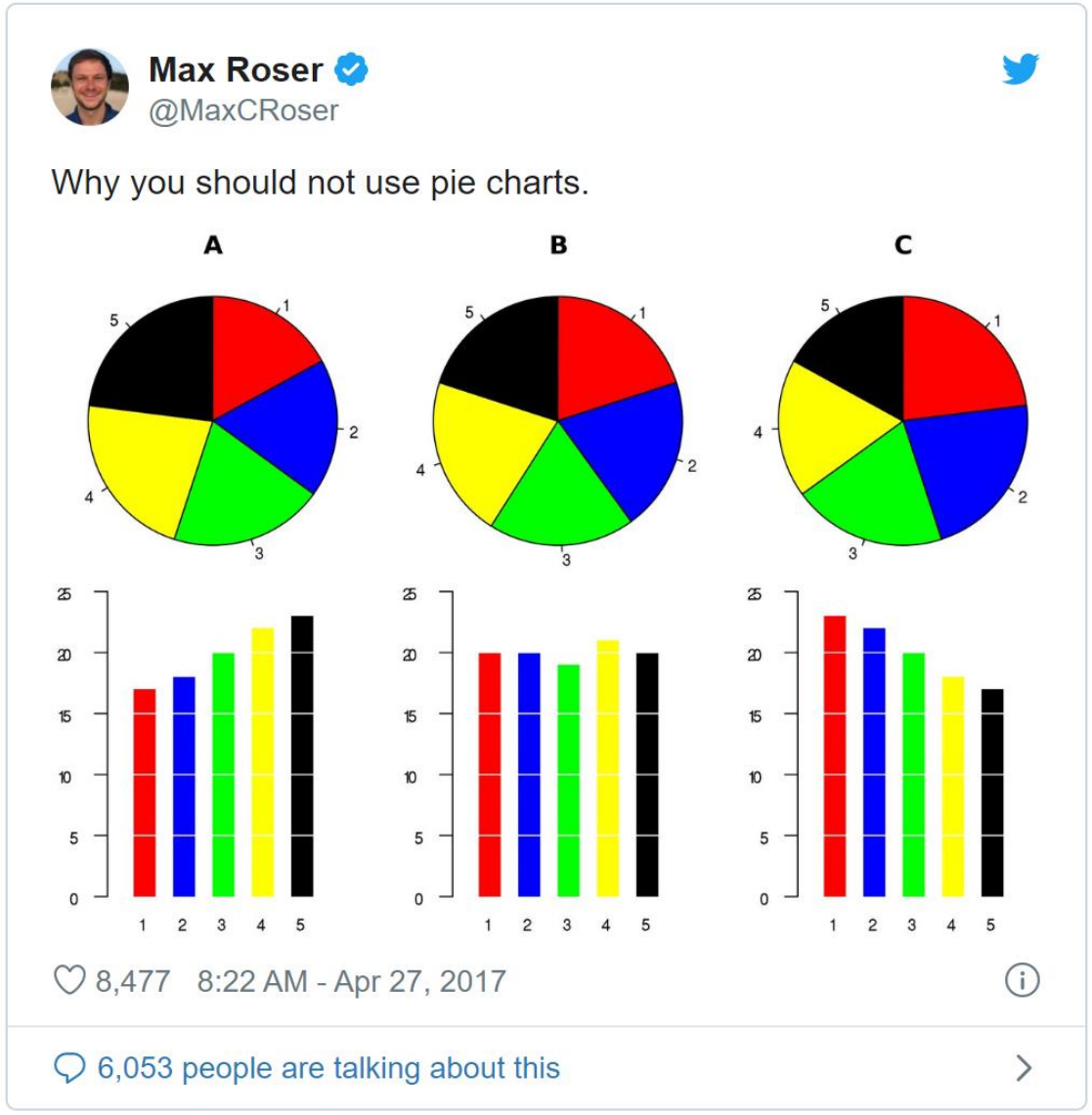
When designing your chart consider the following:

- Is the point your trying to make from your chart self-evident (i.e. would the client be able to understand the point your trying to make without you having to explain it)
- Try to include a chart title to help explain what is shown on the chart
- Try to include a axes titles to help explain what is shown on the chart
- Make sure that the axes are easy to read
- Always start your axes at zero and use set intervals between your major and minor axes
- Minimise how distracting your axes are (remove minor axes and use lighter colours)
- Use data labels to explicitly call out figures, make sure data labels are clear to read
- Don't use 3D elements (i.e. shapes or shadows)
- Avoid pie charts (see the next slide for evidence)
- Make sure that the axes is ordered in a way that helps to demonstrate your point (i.e. sort from largest to smaller or alphabetically)
- Does the chart align to the branding of the client (i.e. colours and text formatting)?
- Use bold colours sparingly to highlight the important features of your chart (consider if your audience may be colour blind though – if so check to see if your chart works in grayscale)





Max is smart. Be more like Max.



WHAT IF WE WERE ASKED TO REPEAT THIS ANALYSIS?

You've done it! Now do it again...

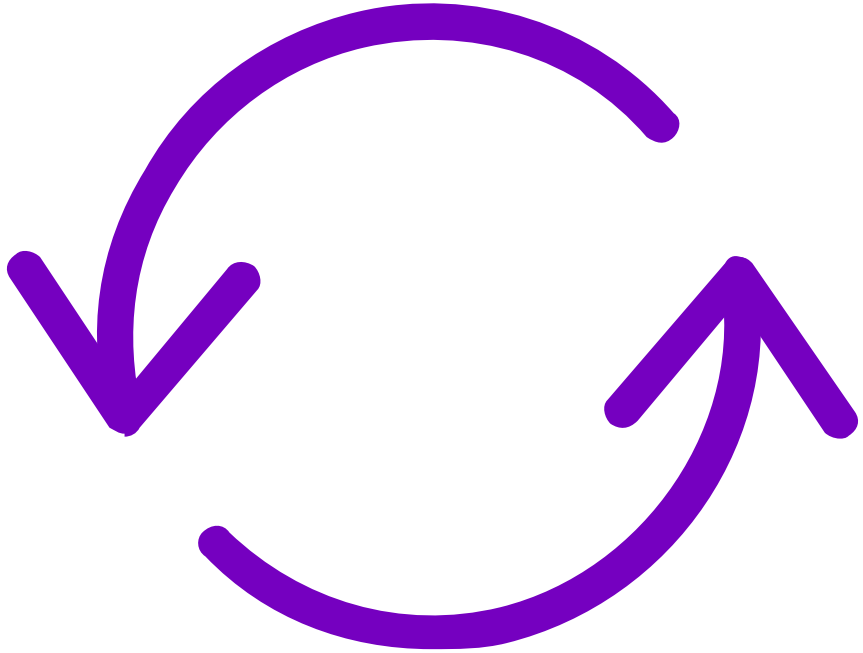
If you're solution is good and is relevant for more than a one time analysis, expect to be asked by your client to produce your analysis again!

In preparation for this consider the following:

- Can you add new data (more row, but the same columns) where you extracted your original data set to?
- Can your model (transformation) work again if new data?
- Does the preparation of your data work as expected with this new data?
- Is this new data presented in a way that acceptable (i.e. still satisfies all the presentation rules)

Some tips for this:

- Leverage relative references or absolute references that stretch beyond the number of rows in your current data set
- Try not to 'hard code' parameters into your model or your presentation, leave dynamic if possible



WHAT COULD OUR USER WANT FROM US IN THE FUTURE?

Making your analysis modular and ready for change

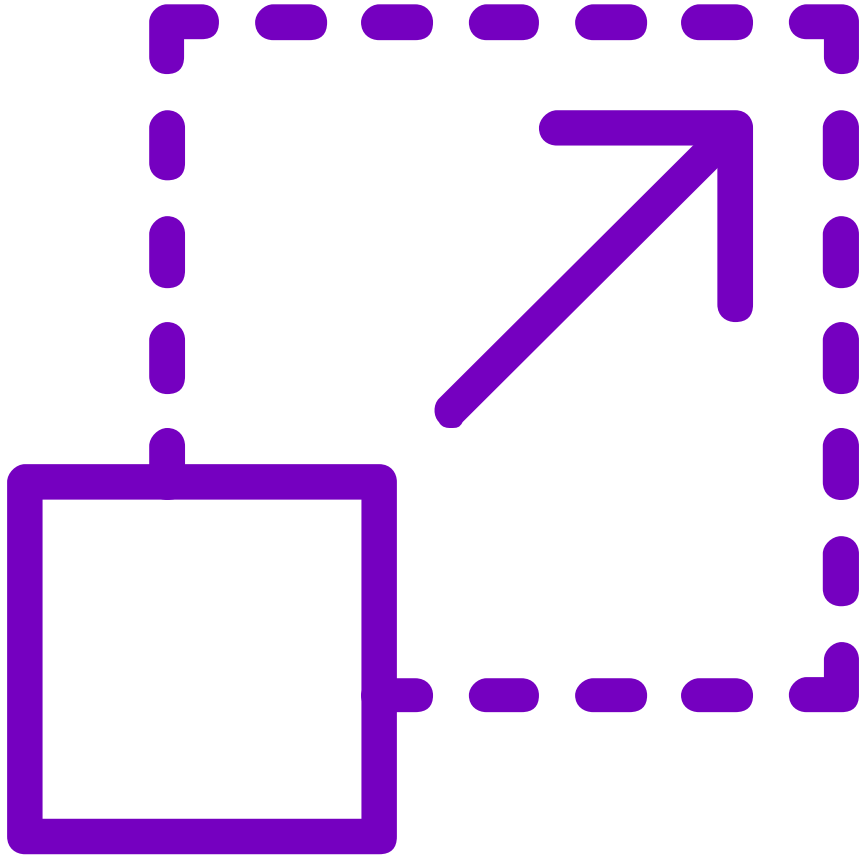
Some things in life never change… Business requests and Data are some one of those things. Either your user will request new views which can hopefully use the same data or may require new data or the data itself will change but the user will want the same view.

In preparedness for this, consider the following:

- Can you add new data (more columns and rows) where you extracted your original data set to?
- What do these new columns do to your transformation and data preparation? (expect some #errors)
- Does the choice of presentation of the data still work with this new data?

Flexibility of your data solutions are key to handle these changes, in Excel please consider using:

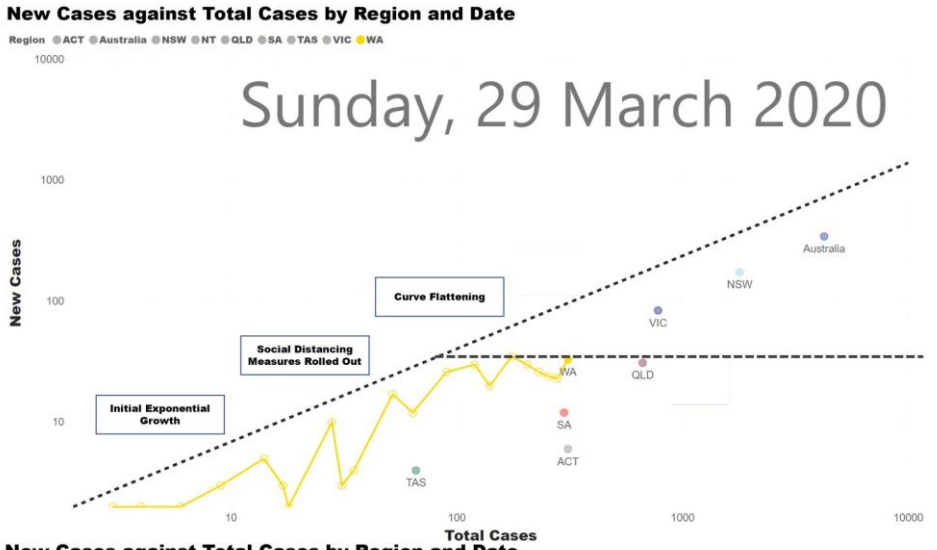
- Data Tables (*Crtl + T* on your selected data)
- Be sure to reference field/column names not row and column IDs
- PivotCharts and PivotTables
- The Refresh Data button (*Crtl + Alt + F5*)



So what have we acheived?

If you have followed the steps above, we have created a meaningful presentation of insights that:

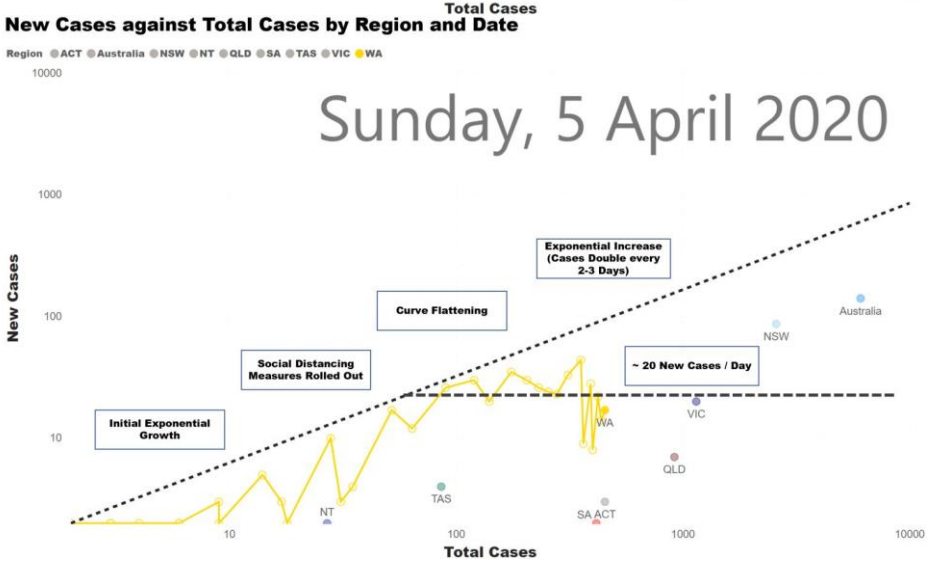
- **Explicitly addresses the key question or validates a hypothesis in a clear manner**
- **Is repeatable**
- **Is scalable**



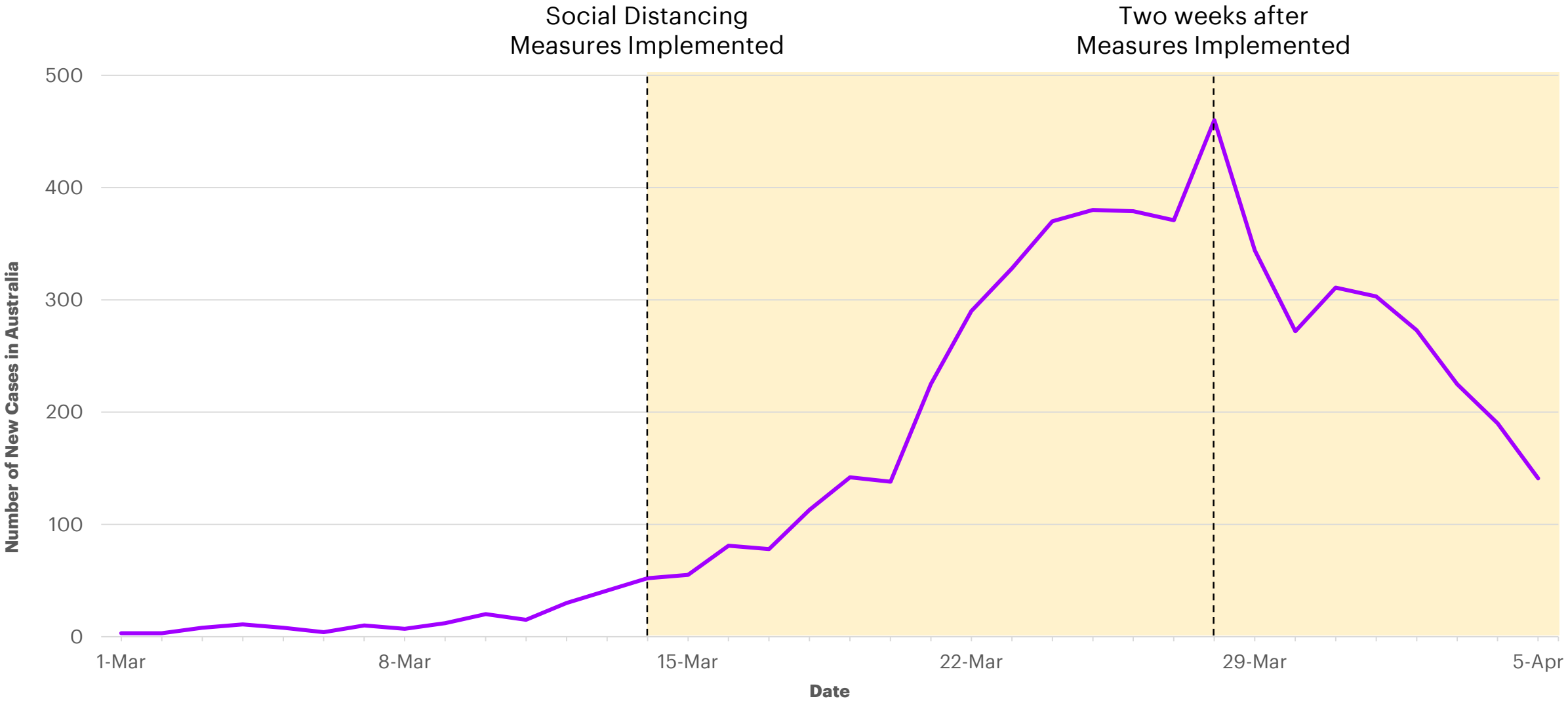
What about the case though?

The pre-prepared graphs are an advanced view of the data. The chart plots (each day is a point) the trajectory of the ratio of New Cases against the Total Cases on a set of logarithmic axes.

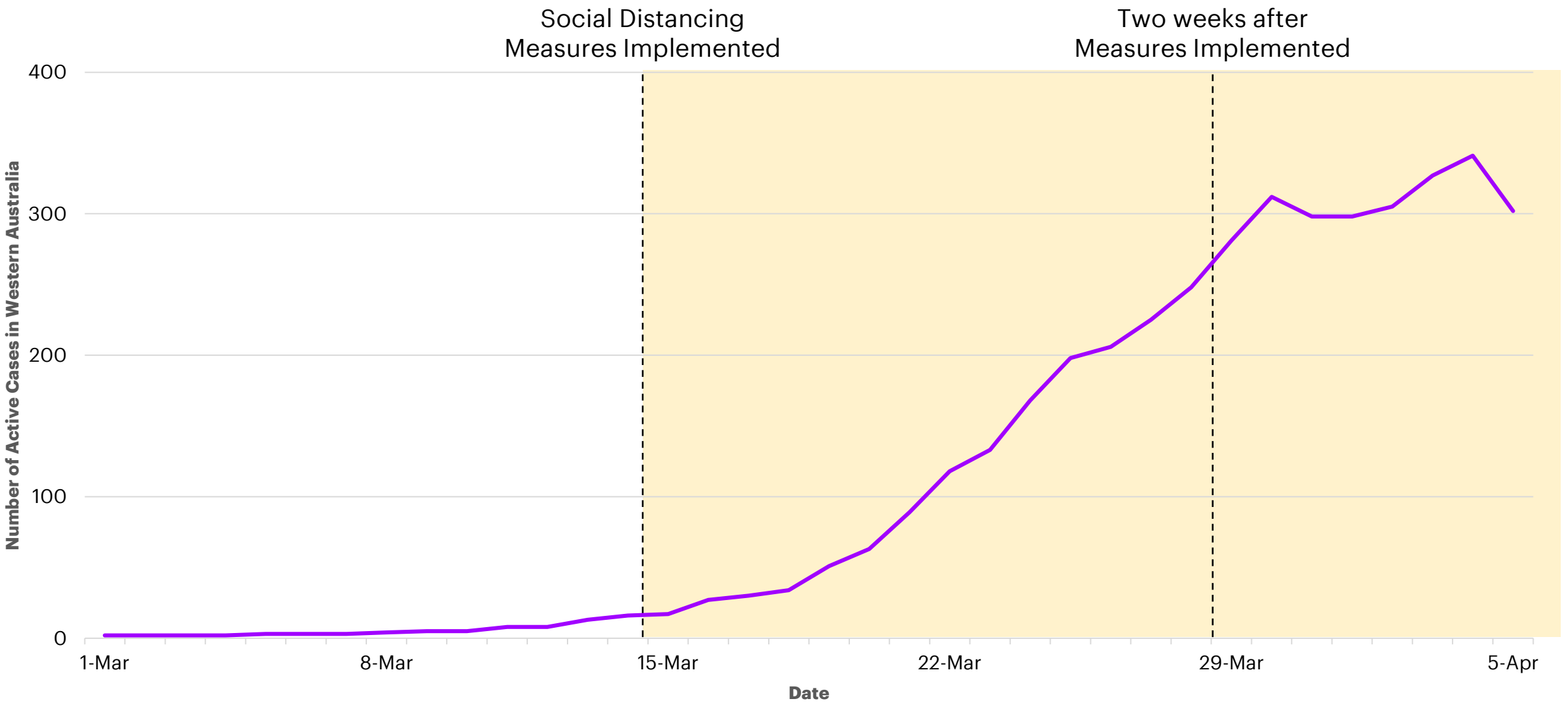
The charts show that initial growth in WA was exponential in nature but social distancing has likely led to curve flattening and therefore a reduction of risk that the hospital system will be overwhelmed.



The number of new cases for COVID-19 appears to be decreasing in Australia as a consequences of social distancing measures being implemented



The number of active cases in Western Australia appears to be stabilising. Showing that number of infections is reducing and number of recoveries is increasing.



Summary of approach

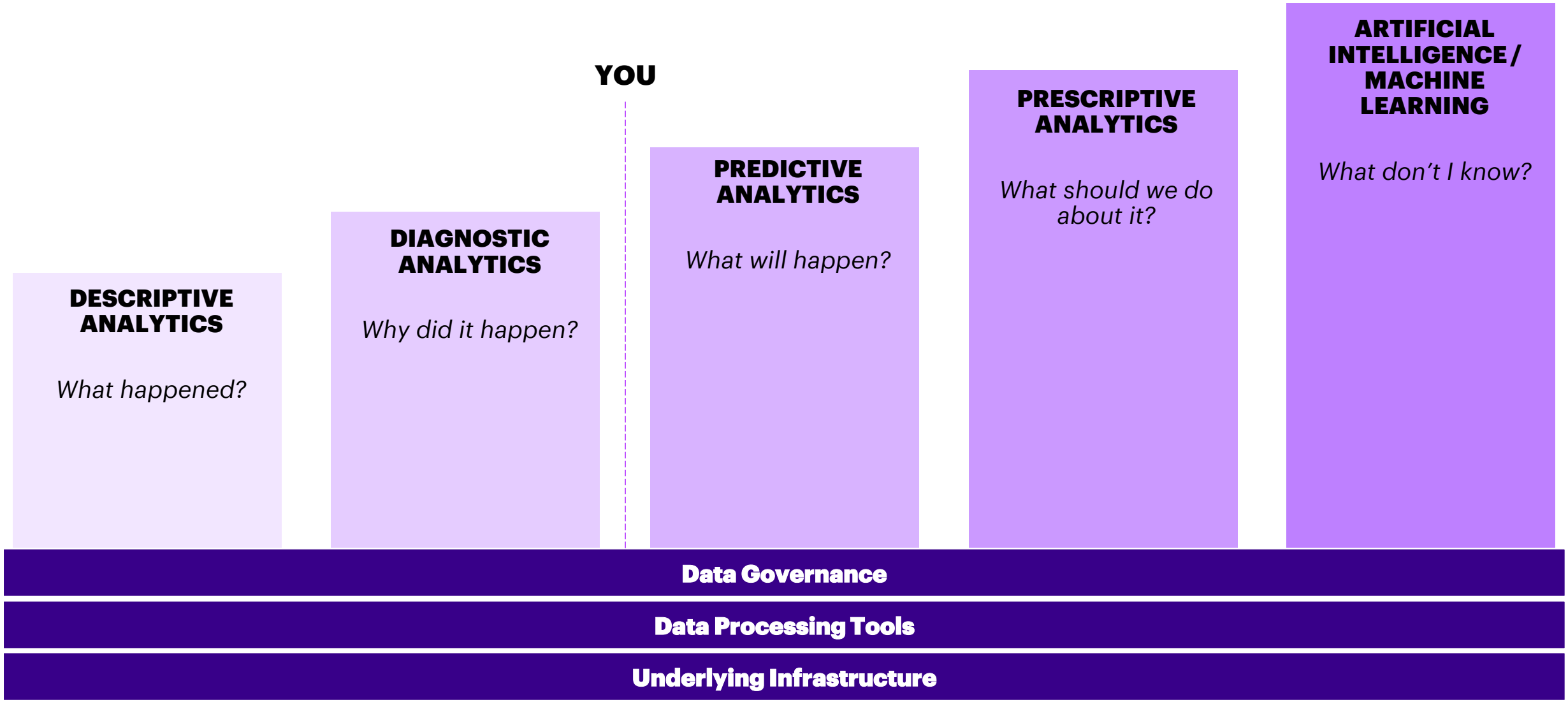
1. Define the problem you are trying to solve or identify a hypothesis you wish to test
2. Think about how the consumer of your findings may want the solution presented
3. Identify data (be it one data set or many) and validate through mapping to the question/hypothesis that may help in answering the question or proving the hypothesis
4. Perform data transformation and preparation
5. Create your initial presentation of the solution
6. Answer the question or validate the hypothesis
7. Test this with your user and iterate if needs be
8. As required – improve the presentation of the solution and build avenues for the solution to be repeatable and scalable

Words of wisdom

- “**Focus on Simplicity**, ability to see the details (easy and quickly), ability see information along different dimensions.”
- “**The view must be co-created with the end user** - but be prepared and bring your own thinking to challenge conventions. Some users need more details than others on a single screen (and depending on device). E.g. field worker on tablet vs clinician at workstation.”
- “**Try to understand the end-user**, walk in their shoes, live their pains and frustrations, and think about where this information adds value. And if it doesn't, then the job wasn't done right.”

WHERE ARE WE NOW AND WHERE TO NEXT?

So where are we on our journey?



What happens when data grows up?

Expect more mature use cases driven by improvements in underlying technologies, reducing the cost required to implement solutions to find value and improve human experiences. Some key use cases in some relevant areas include:

Finance / Commerce – Fraud Detection

Marketing – Personalised Marketing

HR – Recruitment Analysis and Automation

STEM – Energy Optimisation

Health – Early Diagnosis

Law – Paralegal Automation

Arts – Self-Learning Composition and Creation

Operations – Robotic Process Automation (RPAs)

There are current and emerging ethical issues around the use of data, not limited to the sharing of private information (i.e. GDPR) and ethical artificial intelligence.

Why does this all matter to you?

01

Imagine a world without data again...

02

What career are you heading towards – how will technology and data impact this in the short term, mid term or long term?

03

How will data impact (and hopefully) improve your life?

INTERESTED IN DOING MORE?

GRADUATE RECRUITMENT

Your Graduate Journey

Today

RECRUITMENT

A standardized recruiting approach for all Analysts

Day One

ONBOARDING

A common learning experience that begins with a unified onboarding experience and continues with ongoing foundational

First Year

DISCOVERING PASSION AND STRENGTHS

After building a strong foundation through various experiences and training, deepening skills and finding interest areas.

Second Year

DEPLOYMENT PROCESS

Be aligned to one of the 3 programs and continue to deepen skills and experience.

WHERE TO NEXT?

Beyond

DEPLOYMENT

Consultants will move out of the Programs into a DTE or continue to deepen their experience in Technology, H&PS or Consulting.


Thanks.
PERTH
INNOV
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HUB
accenture