

The Organisation IS the System

An information management framework

Compliance and Risk – 1. Introduction

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About the Author:

- Allen Woods, retired several years ago....
- Ex British Army (1971 – 1995) Taught Arctic Warfare, Several Years On Operations, Funded Himself through College to Study IT
- Chartered Member of the British Computer Society for 20 years
- Member of the Chartered Status Interview Panel for BCS
- In 2010, Finalist of UK “Developer Of The Year” Competition for MOD HSIS
- Primarily Employed in UK Defence Supply Chain and Logistics IT since 1995 until 2019
- Credits: MoD Health and Safety Information System, Various Internal to Defence P&G Portals, CATMIS, IQB Oversight to Defence Voyager Programme IM Transformation and more...

Compliance and Risk – 1. Introduction

Introduction

The purpose of this series is to set out some principles of performance measurement through the medium of regulatory compliance, risk monitoring and the use of a legislation library as a series of integrated components of a digital organisation map

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Caveats

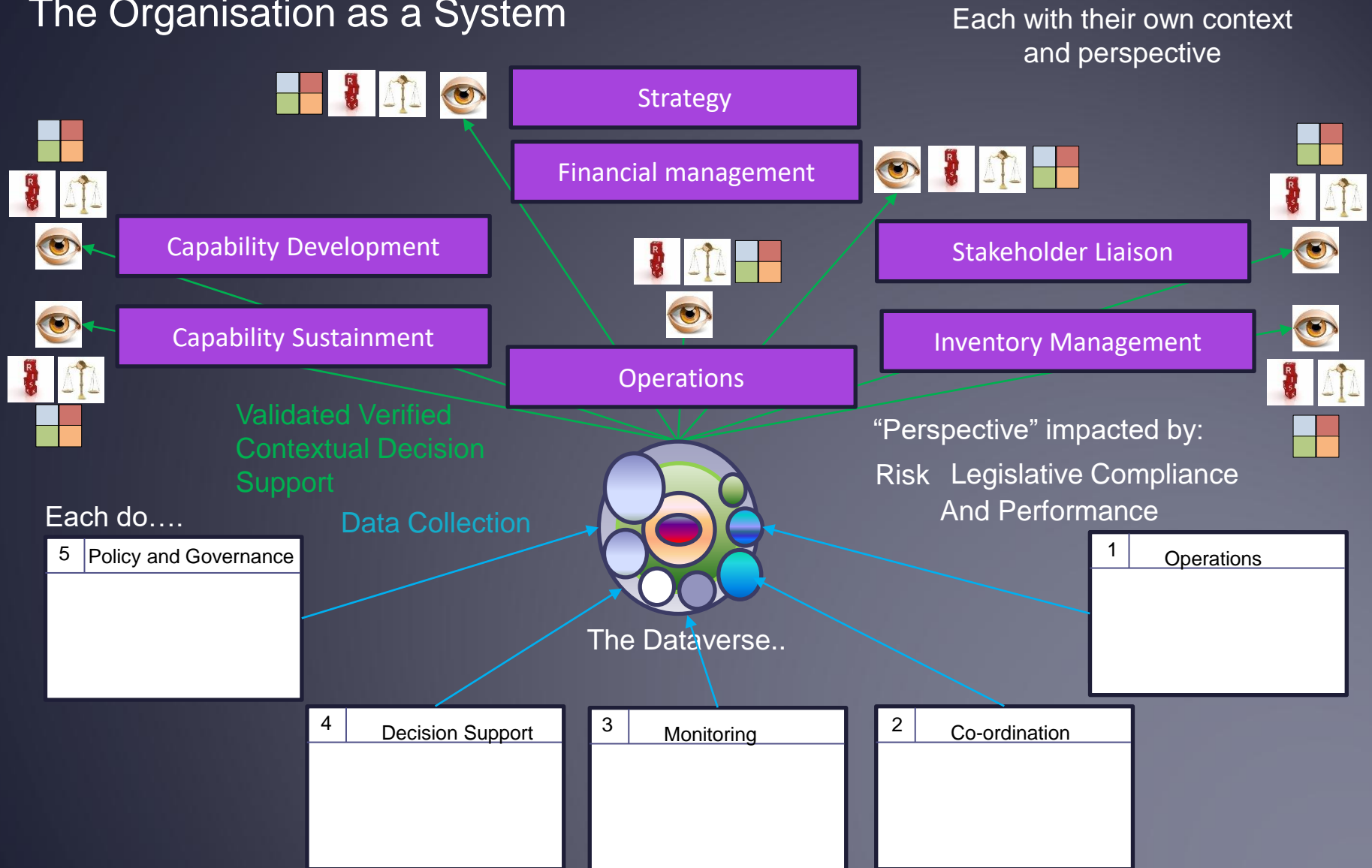
These decks are to be treated as pathfinder not gospel.
Just one way of doing things, not “the” way. The
advantage? The decks are based on experience and the
nature of the capabilities set out in these decks and the
way they were built can be demonstrated.

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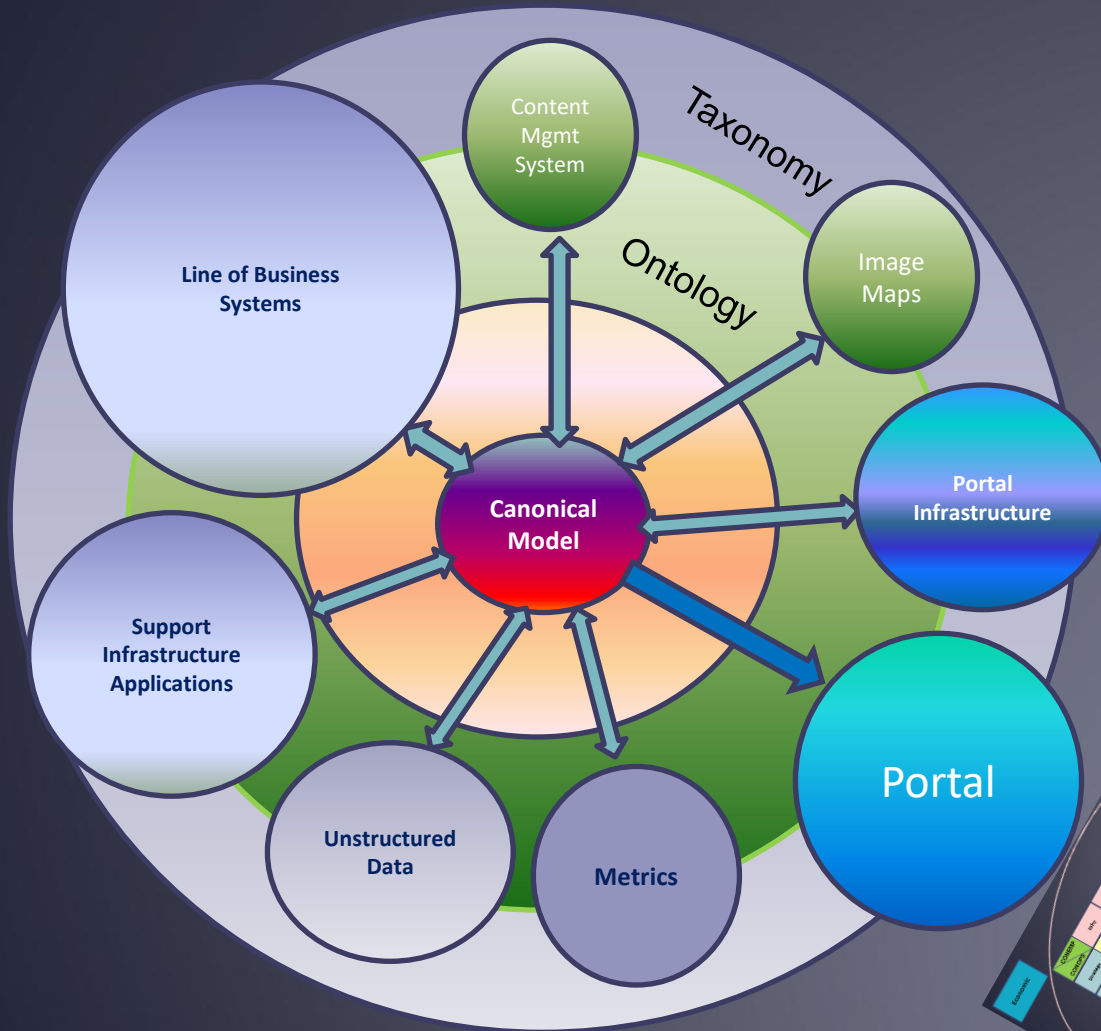
Part 1 - A Little Targeting Theory

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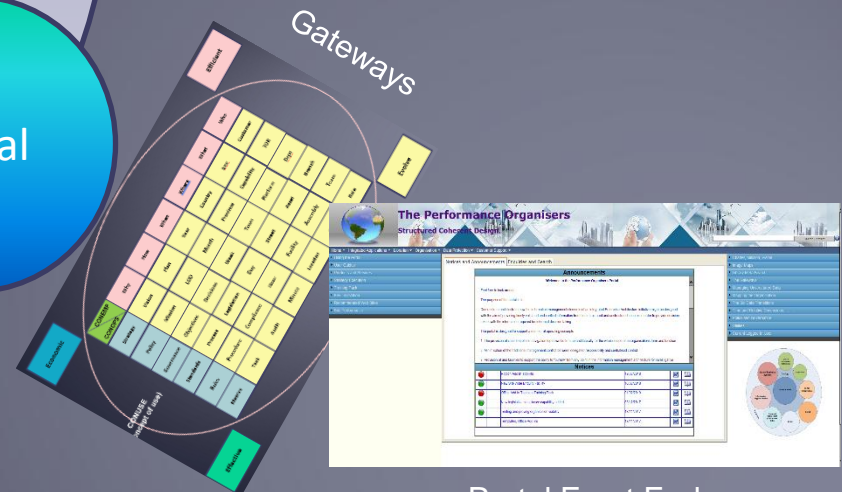
The Organisation as a System



Conceptually.....



An Architecture...

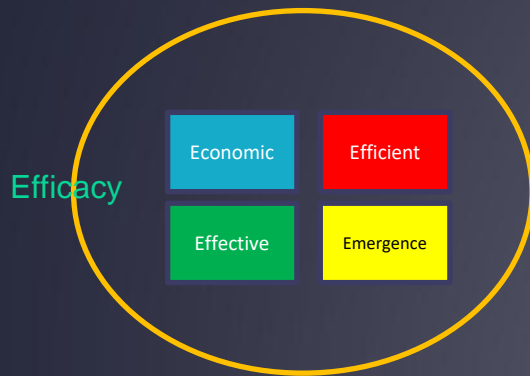


The Old Geek

Portal Front End

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Viability, Perspectives and Emergence



Information technology IS NOT the system. The system is much wider in scope and diversity. The purpose of IT, in the main, is to provide hard, accurate, validated and verifiable decision support to those who need it that is both contextually relevant and timely

The aim, to ensure the viability of the system by proving “efficacy”

Efficacy is multi perspective in nature, for the purposes of this exercise, there are four core perspectives:

Economic: - Anything to do with the management of finance

Efficient: - The best use of internal resources and capabilities

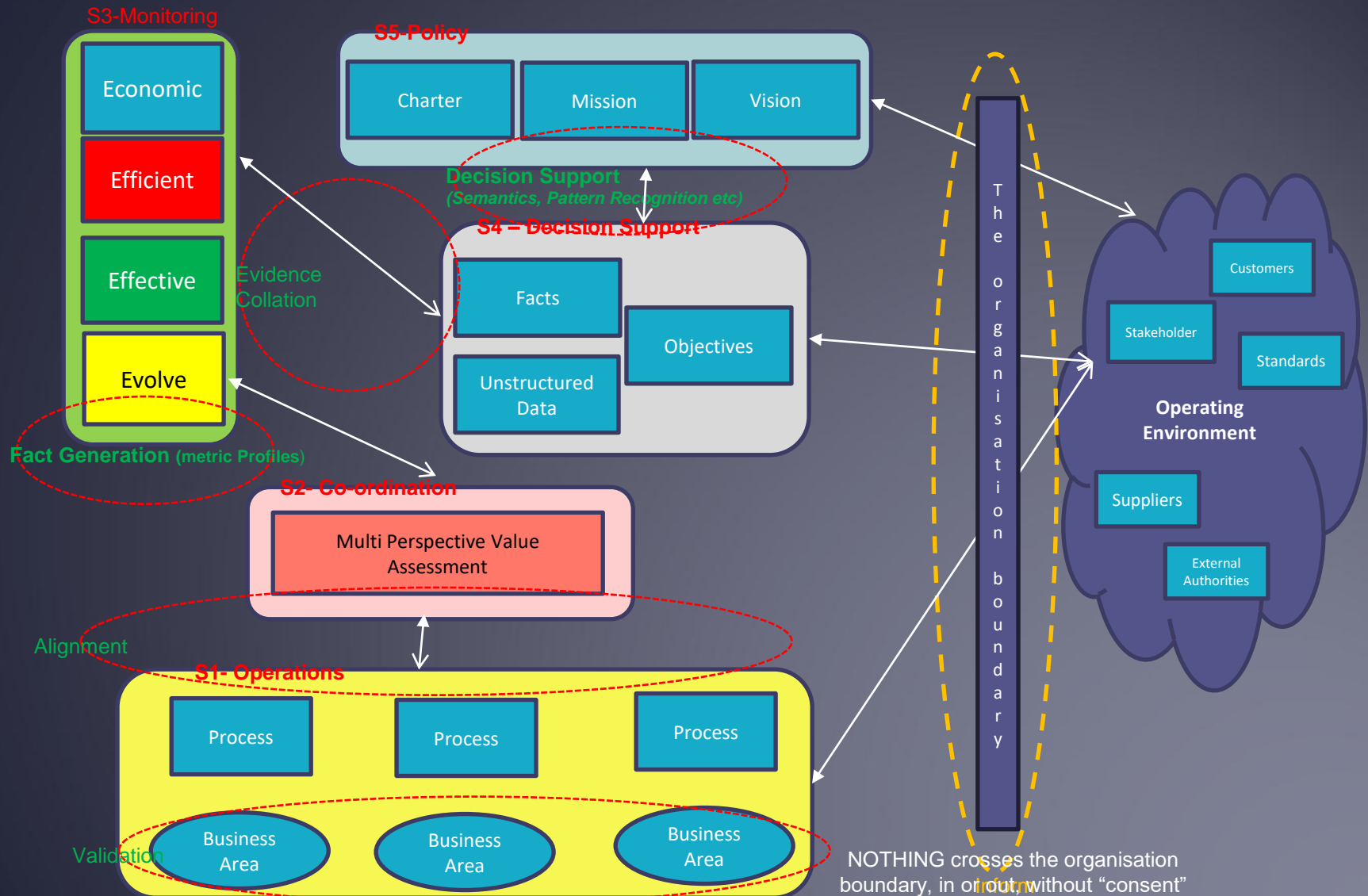
Effective: - Relating to the needs of stakeholders (customers, suppliers etc., and meeting their needs

Emergence: - Acknowledges that systems are impacted by both internal and external changes and that it is desirable to monitor such changes with the aim of identifying capability shortfalls for which the organisation as a system must mitigate and address in order to maintain viability

Of all of the perspectives, “Emergence” is perhaps the most difficult to analyse and appreciate because of the nature of change it represents which may be unknown initially at least. With any change having velocity that increases the closer a change issue becomes an event

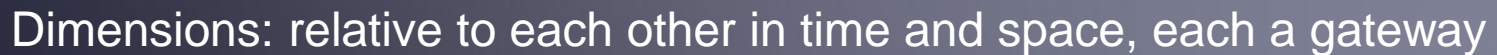
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6 transition and attenuation bi-directional feedback loops



Data Captured at Source goes through several Transition and Attenuation stages to prove viability but in the context of the decision taker that must be co-ordinated as “what if” is asked.

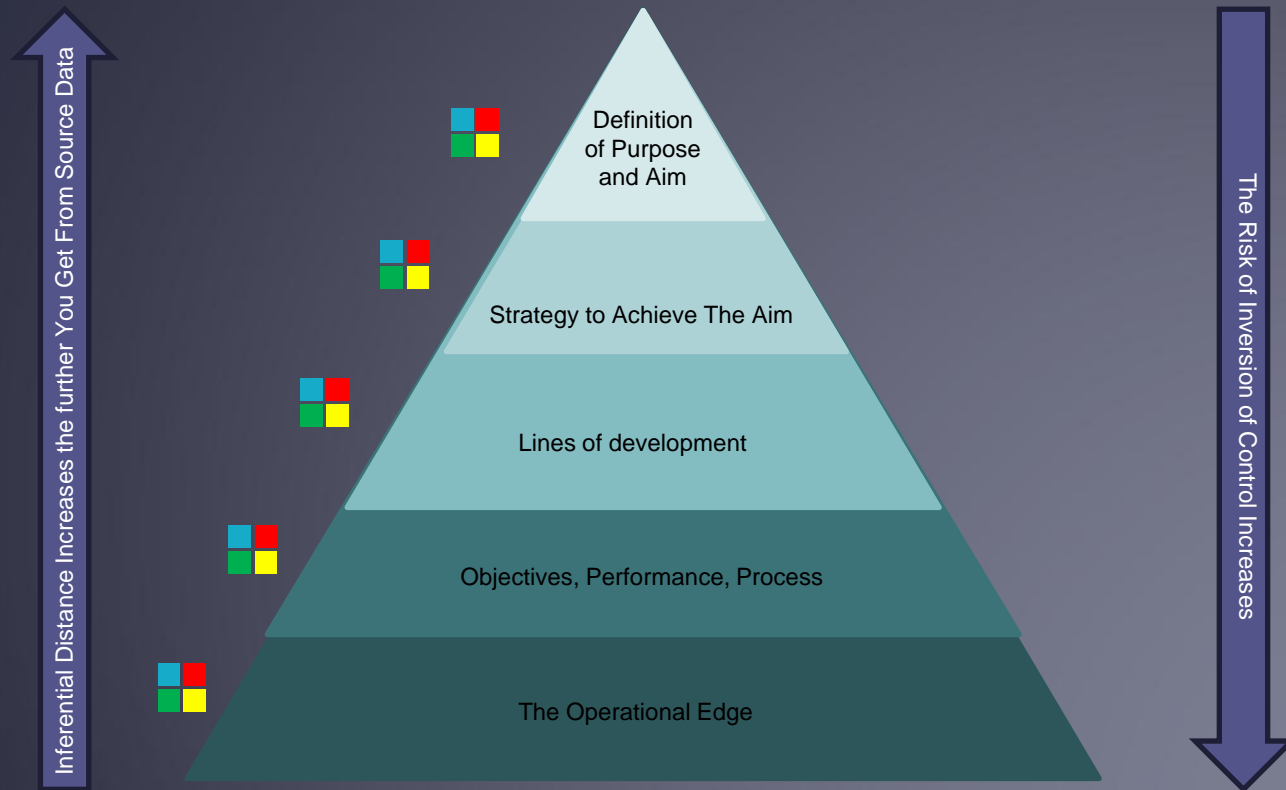
Cross referencing of facts...



The Old Geeks Shed

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My Bosses Boss Does Not Need To Know What I
Know In The Way I Need To Know It

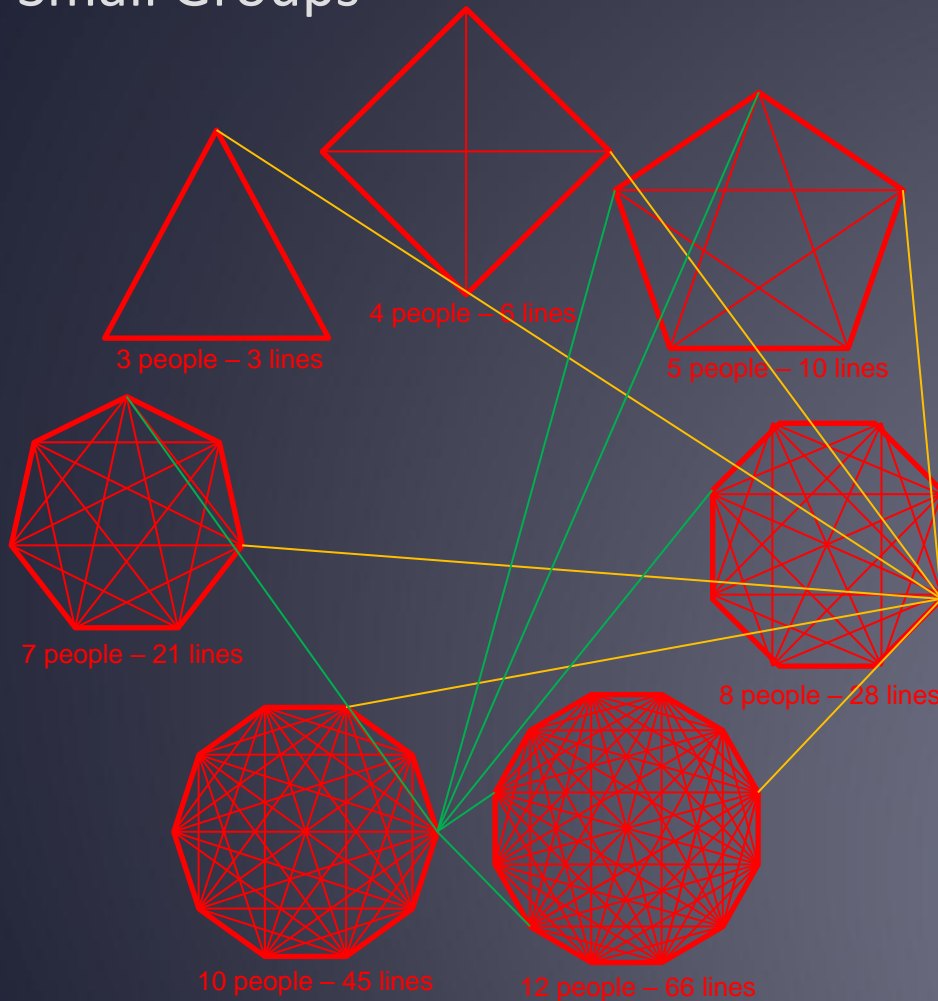


Clear Line Of Site IS Fundamental

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How Communication Channels Grow In Complexity In Teams And Small Groups



Noting too that some of those lines will be formal, some informal. Many will be intermittent and therefore transient and as the organisation changes shape, as it does, the emphasis and number of lines may increase or decrease.

What should also be considered is that teams and small groups may talk to each other across their boundaries at times and periods of their choosing

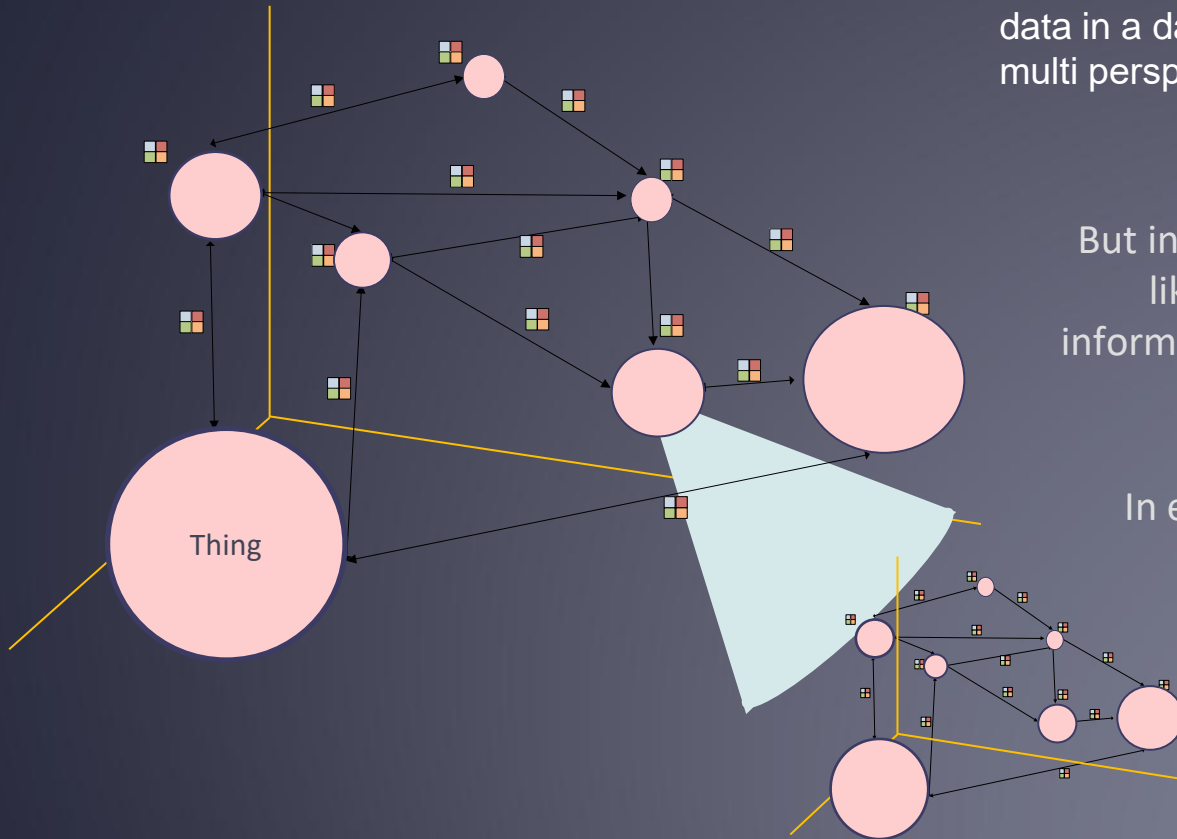
Above all, never underestimate the ears of the tea lady..... Many will be listening in, but not communicating directly...

It all gets difficult to keep track of, but every effort must be made to do so..

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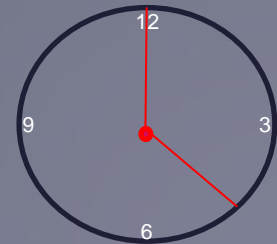
Things, Relative to Each Other In Time and Space

The whole giving rise to the means to treat all data in a dataverse as a multi dimensional, multi perspective “graph schema”



But in addition, to support Fractal like decomposition as the information requirement gets more specific

In effect, a new form of geometry



All constrained by time

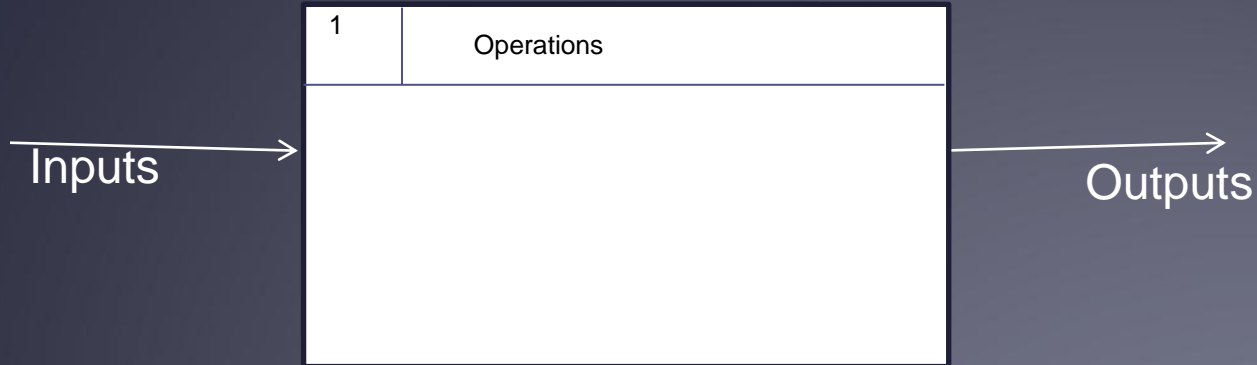
Noting that both “things” and relationships between them are transient

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Part 2 – Performance Monitoring

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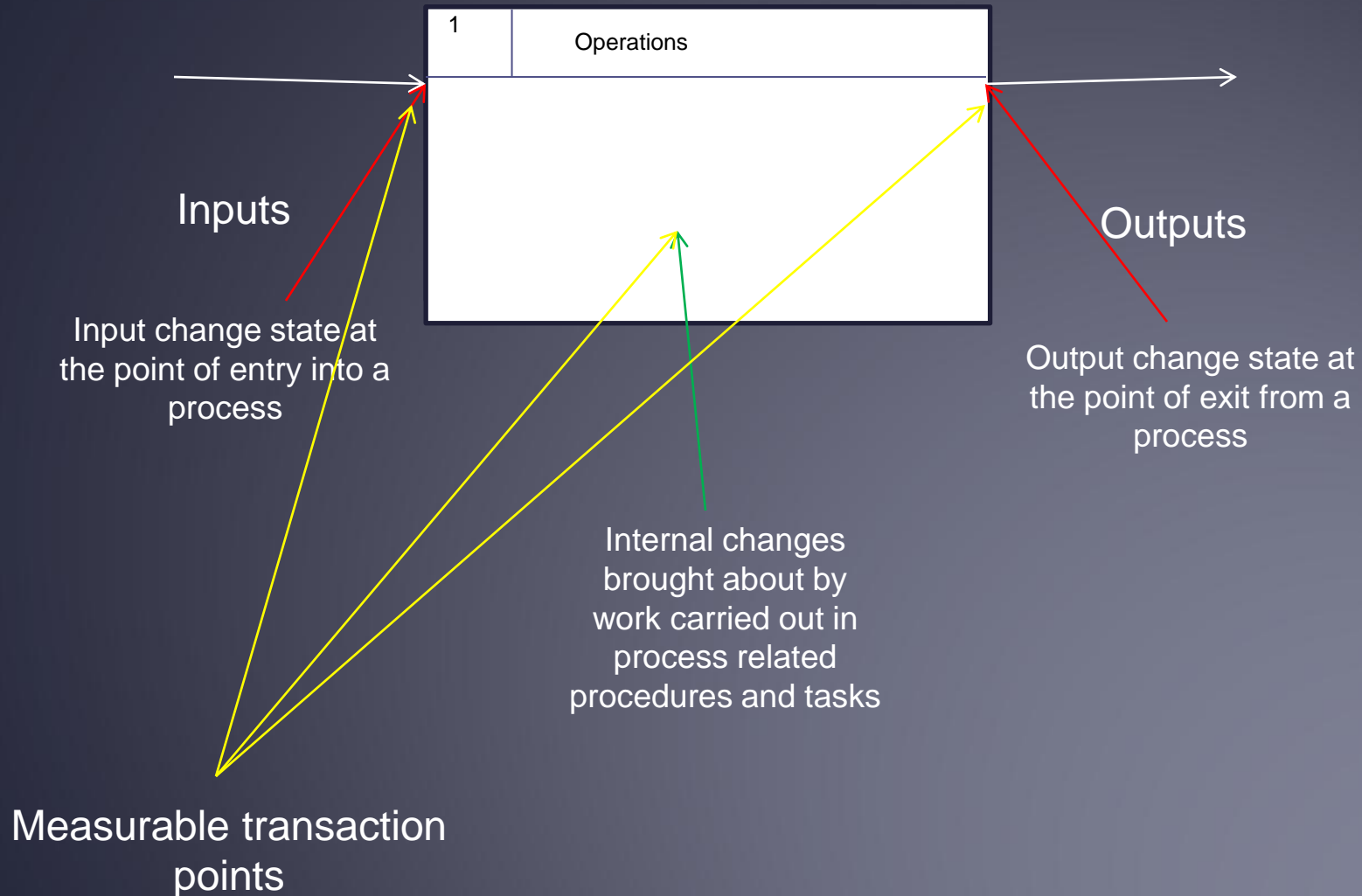
Principles of Measurement



- Data collection for performance monitoring purposes occurs at the process level
- Metric data should support the identification of changes in the maturity state of goods or services being developed or delivered in the process under review when using the resources allocated to it.
- A possible work breakdown taxonomy is Process -> Procedure -> Task

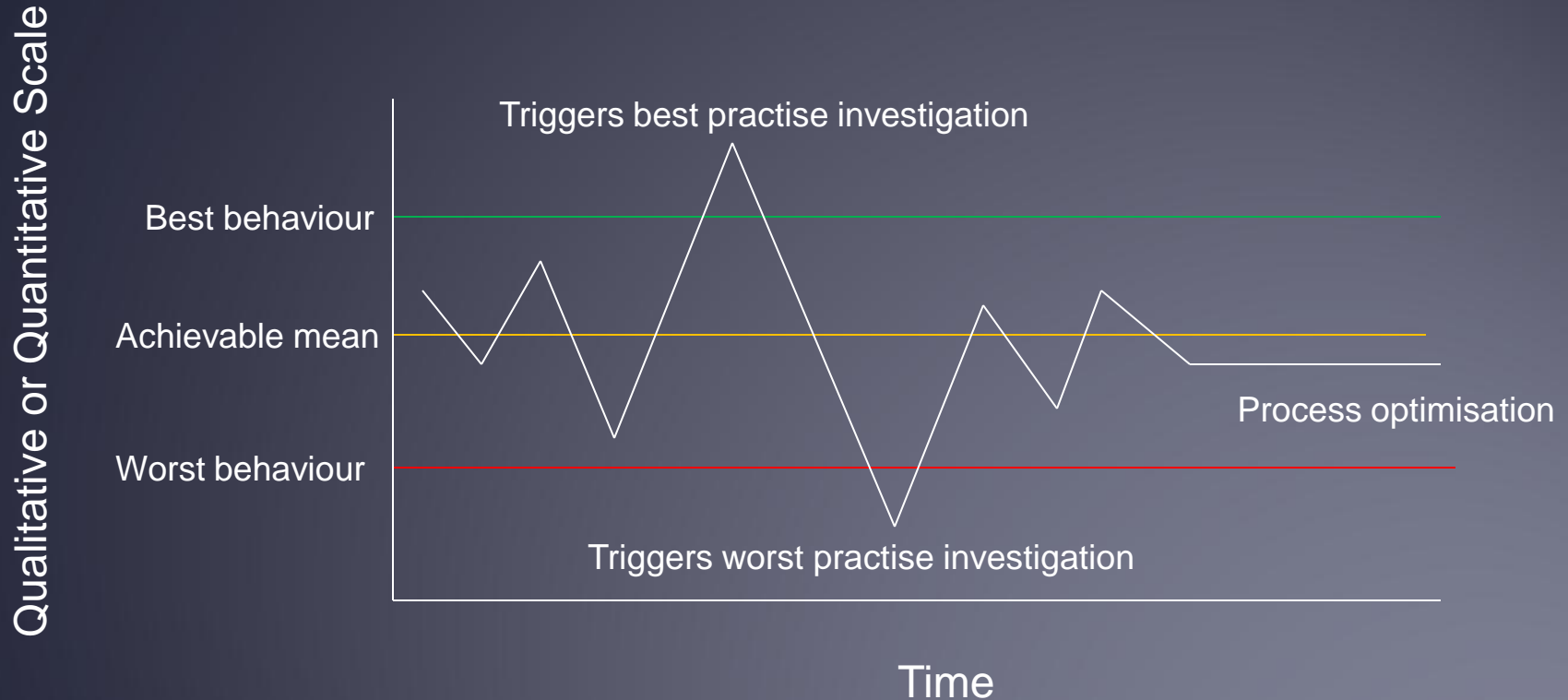
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Principles of Measurement



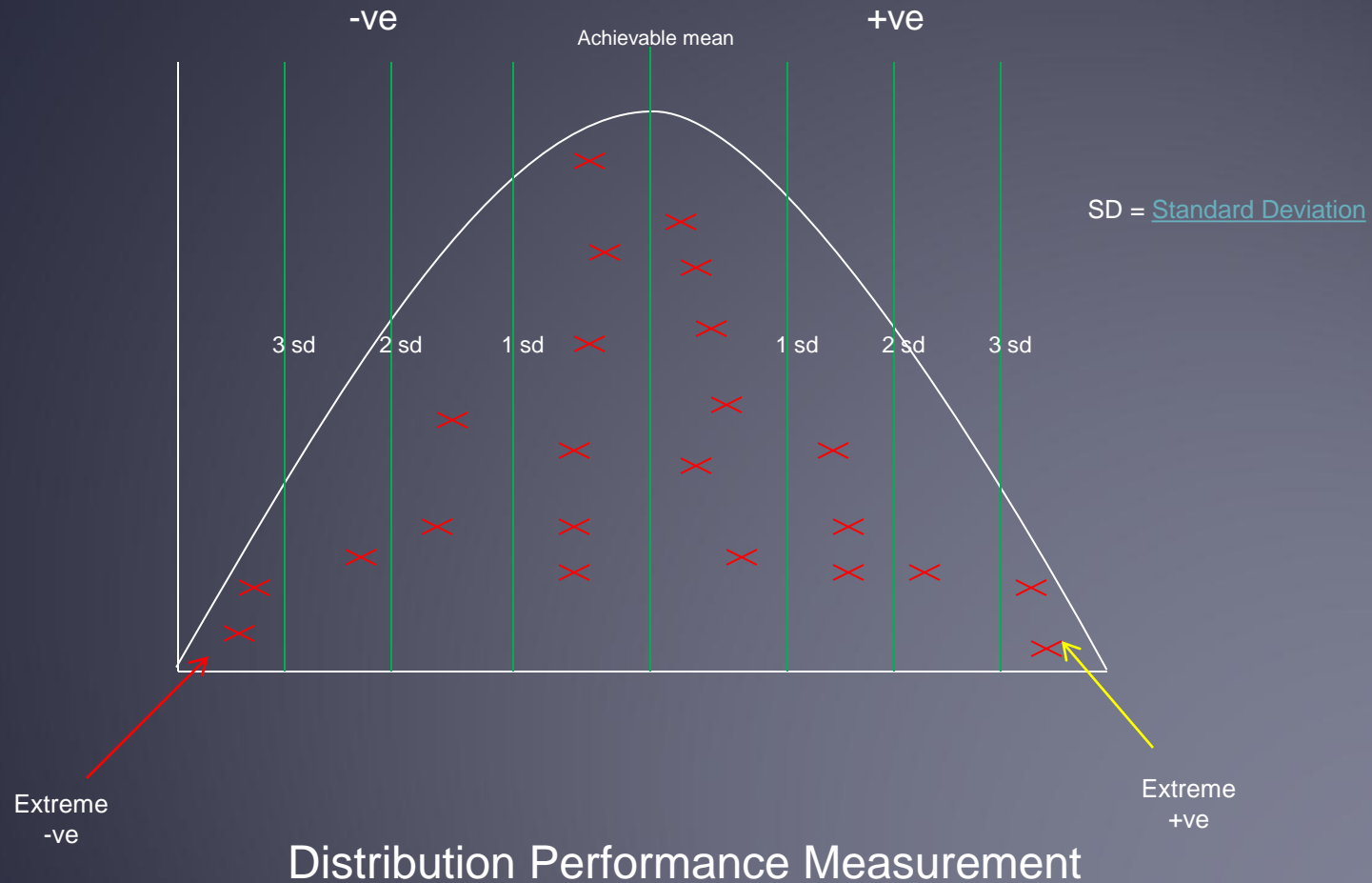
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Moving Range Performance Measurement



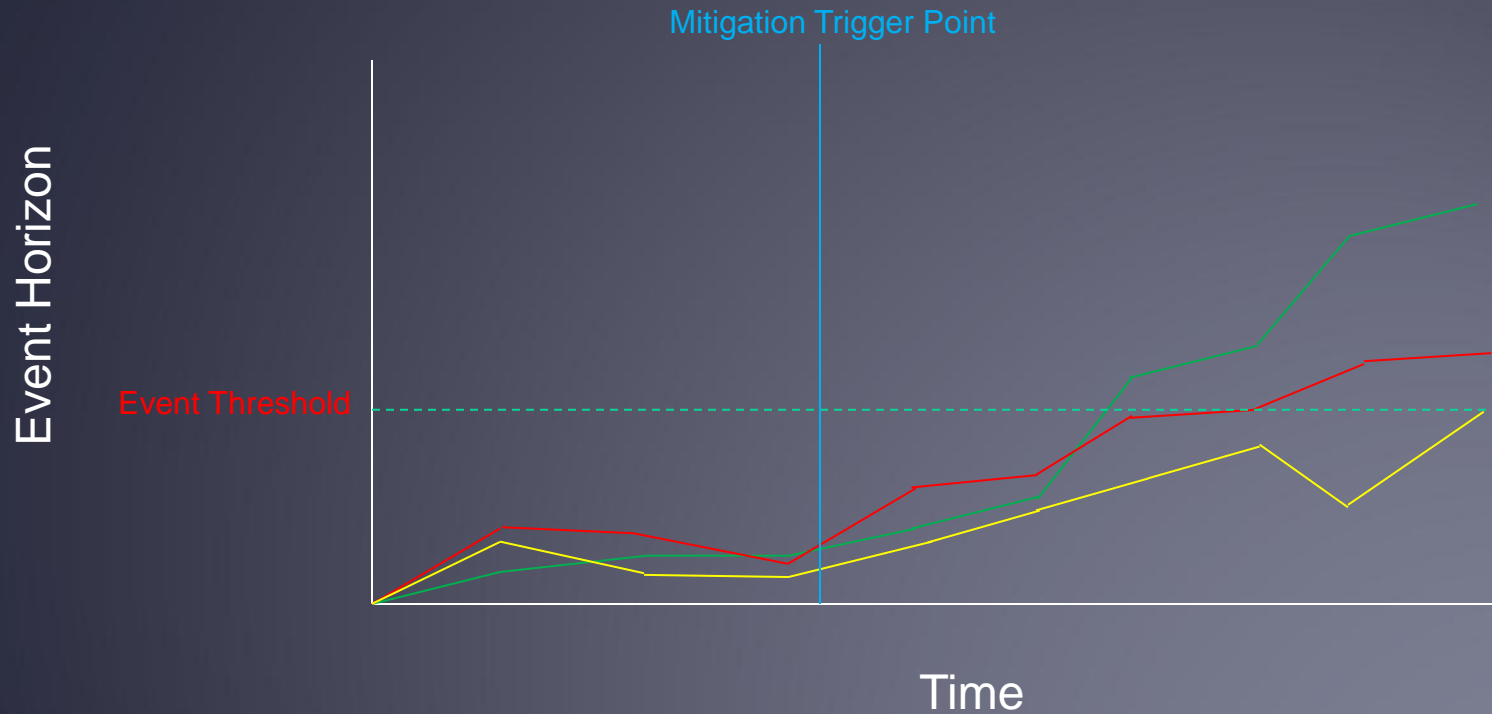
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Standard Deviation



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Three Point Estimation, Velocity and Emergence



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Hi-Lo Impact Assessment



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Some Statistical Methods (1)

5 Regression Metrics:

1. Mean Absolute Error (MAE): Average magnitude of errors in a set of predictions, without considering direction.

2. Mean Squared Error (MSE): Average of the squares of the errors; gives higher weight to larger errors.

3. Root Mean Squared Error (RMSE): Square root of the mean of the squared errors.

4. R-squared (Coefficient of Determination): Measures the proportion of variance in the dependent variable that is predictable from the independent variables.

5. Mean Absolute Percentage Error (MAPE): Measures the size of the errors in percentage terms; it's the average absolute percent error for each time period minus actual values divided by actual values.

Regression Metrics:

$$MAE = \frac{1}{n} \sum_{i=1}^n |y_i - \hat{y}_i|$$

$$MSE = \frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$$

$$RMSE = \sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2}$$

$$R^2 = 1 - \frac{SSR}{SST} = 1 - \frac{\sum_i (y_i - \hat{y}_i)^2}{\sum_i (y_i - \bar{y})^2}$$

$$MAPE = \frac{1}{n} \sum_{i=1}^n \left| \frac{y_i - \hat{y}_i}{y_i} \right|$$

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Some Statistical Methods (2)

5 Classification Metrics:

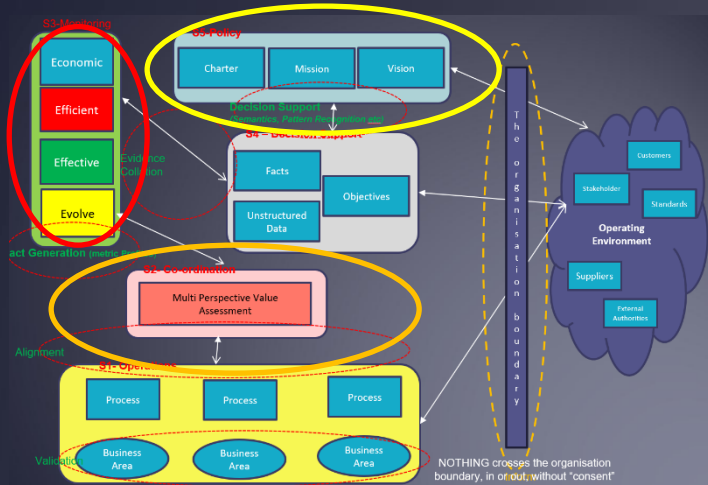
1. Accuracy: Measures the proportion of correct predictions among the total number of cases.
2. Precision: Ratio of correctly predicted positive observations to the total predicted positives.
3. Recall (Sensitivity) Ratio of correctly predicted positive observations to all actual positives.
4. F1 Score: Harmonic mean of precision and recall, useful for imbalanced datasets.
5. Area Under the ROC Curve (AUC-ROC): Compares true positive rate (sensitivity) with false positive rate (1-specificity).

Classification Metrics:

| | | predicted condition | | |
|----------------|--------------------|---|--|---|
| | | prediction positive | prediction negative | |
| true condition | total population | | | |
| | condition positive | True Positive (TP) | False Negative (FN) (Type II error) | Sensitivity Recall = $\frac{\sum TP}{\sum \text{condition positive}}$ |
| | condition negative | False Positive (FP) (Type I error) | True Negative (TN) | Specificity = $\frac{\sum TN}{\sum \text{condition negative}}$ |
| | | Precision = $\frac{\sum TP}{\sum \text{prediction positive}}$ | | F1 Score = $\frac{2}{\frac{1}{\text{Recall}} + \frac{1}{\text{Precision}}}$ |
| | | Accuracy = $\frac{\sum TP + \sum TN}{\sum \text{total population}}$ | | |

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Further Measurement Considerations



In the previous 2 slides a number of statistical analysis formulas are provided for their analytical utility, they are not the only ones that matter. There are courses galore than need studying.. Like... The one available [here](#)

Much of what is illustrated in this section in respect of application falls into the scope of more than one of the transition and attenuation stage illustrated in the image to the left

The various techniques described being applied here (the generation of “facts”), or...

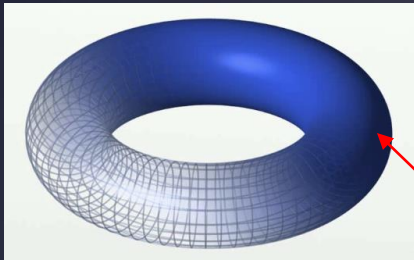
the alignment of various forms of operational level data

Which are necessary precursors to the application or mathematically more complex techniques like regression and probability testing

All of which is “processor intensive”, constrained by time in several ways. All of which has considerable design complexity. All of which needs considered planning and is a tad expensive.....

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Presentation and Context – Navigation Top Down, Bottom Up...



In any complex reporting environment the following operating principles should apply:

Presenting data visually requires a degree of [artistic flair](#) with the aim of telling a story..

My bosses boss does not need the same kind of report I do

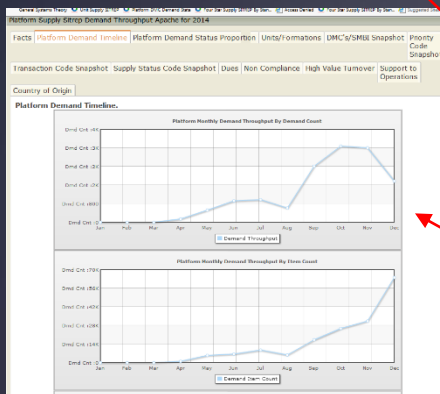
There is a need to support investigation at every level in the reporting structure...

Each chart reflecting required detail and context

When clicked each data point a gateway into the next level of detail

And so on, down to the raw data

Including supporting documents



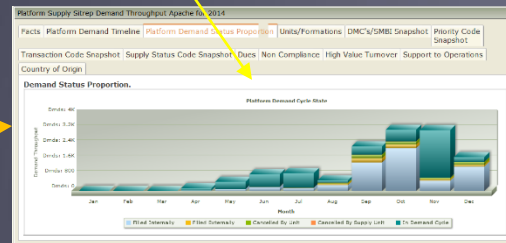
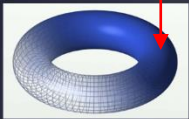
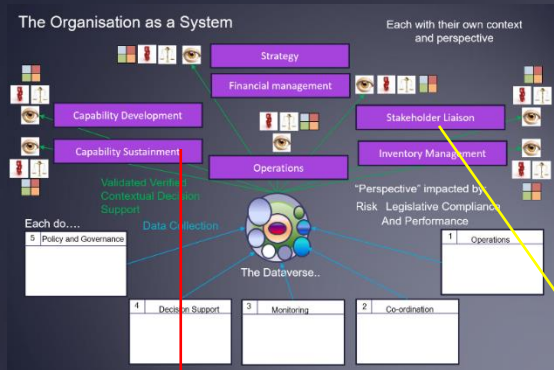
There is also a requirement to investigate laterally...

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Presentation and Context – And Laterally

Where visibility and access constraints allow...

Support lateral navigation for investigative purposes

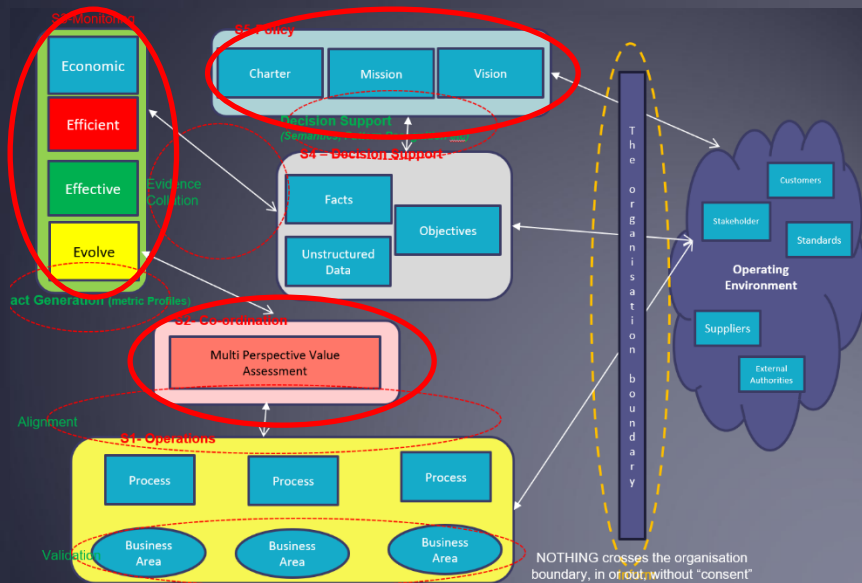


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Which Of Course Means.....

There is a need to either write some complex graphics software yourself...

Or there is a need to select specialist software of one kind or another



And a need to position the capability offered by such tools within the data to information attenuation/transition structure

Some sample code libraries for the presentation layers [JavaScript](#), [Python](#)

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Finally

This deck sets out, in overview, some of the design considerations to be taken into account when trying to build a toolkit on which to base the monitoring and measurement of compliance risk with the aim of planning mitigation that results from the identification of capability shortfalls

Three short decks follow setting out details of a compliance monitoring toolkit covering:

A primary legislation librarian

An objective process level audit survey tool

A risk register supporting “three point estimation”

Note, the underlying importance of “the organisation as a system”

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That's all folks.....

The original deck and others, are available on request, free, using any of these means to get in touch:

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