Cybernetic Thinking Applied to Regulation of Organisational Financing

Dr Steve Morlidge

SCiO Open Meeting – July 2021

The Promise

The Viable Systems Model is an elegant and profound intellectual achievement, but its practical impact and recognition is limited, at least in the world of business.

In this talk Steve Morlidge will demonstrate how he has introduced cybernetic thinking into the design and description of innovative management practices to improve the regulation of organisational financial resources, specifically:

- Alternatives to traditional annual budgeting
- Business forecasting
- Resource Allocation
- Performance reporting
- Goal setting

I will frame this as a practical example of what Beer called transduction, where sophisticated cybernetic ideas are introduced into practical discourse using language that makes them intelligible and accessible while creating a portal into the world of systems that many (hopefully) will want to explore.

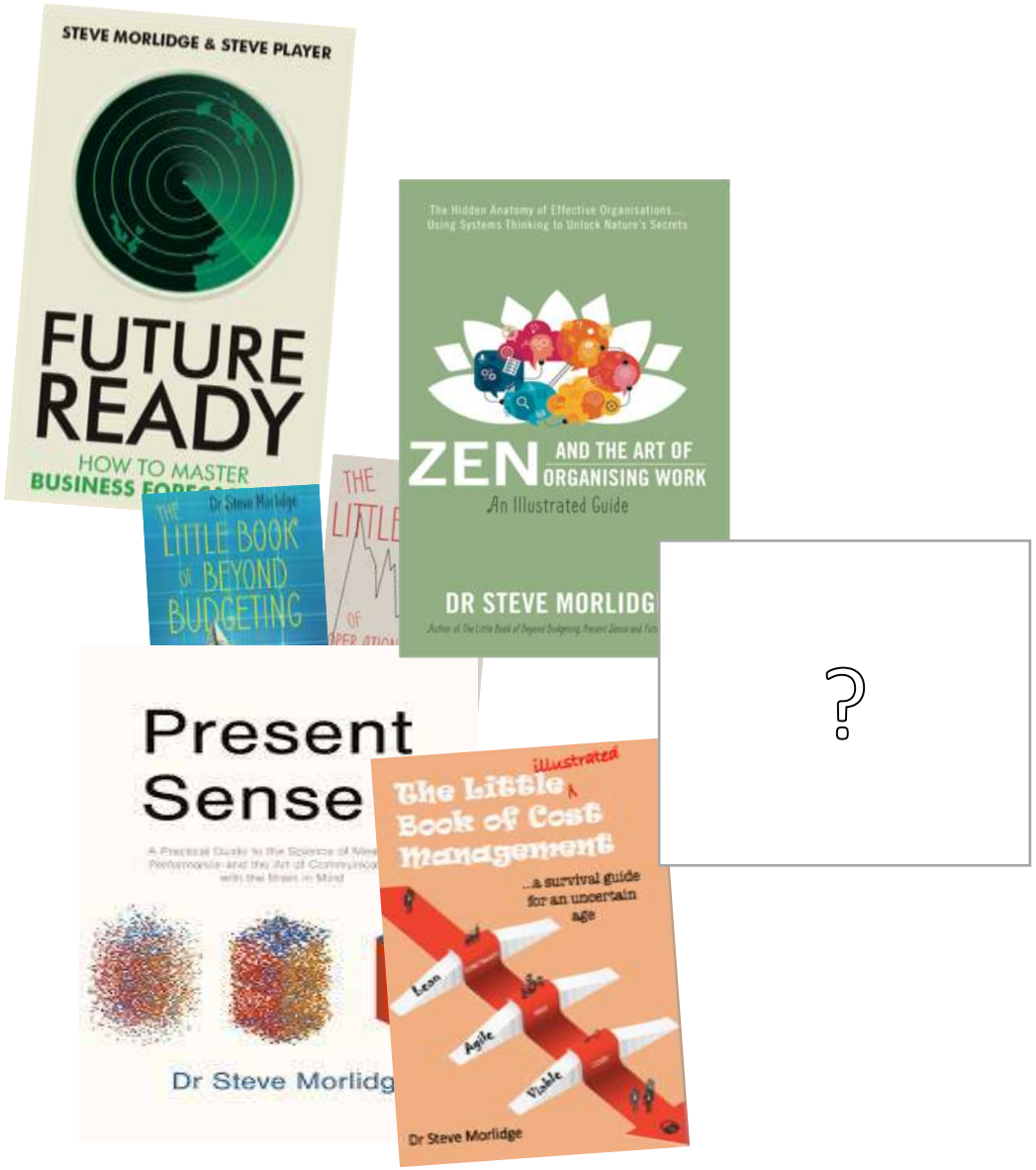
Dr Steve Morlidge

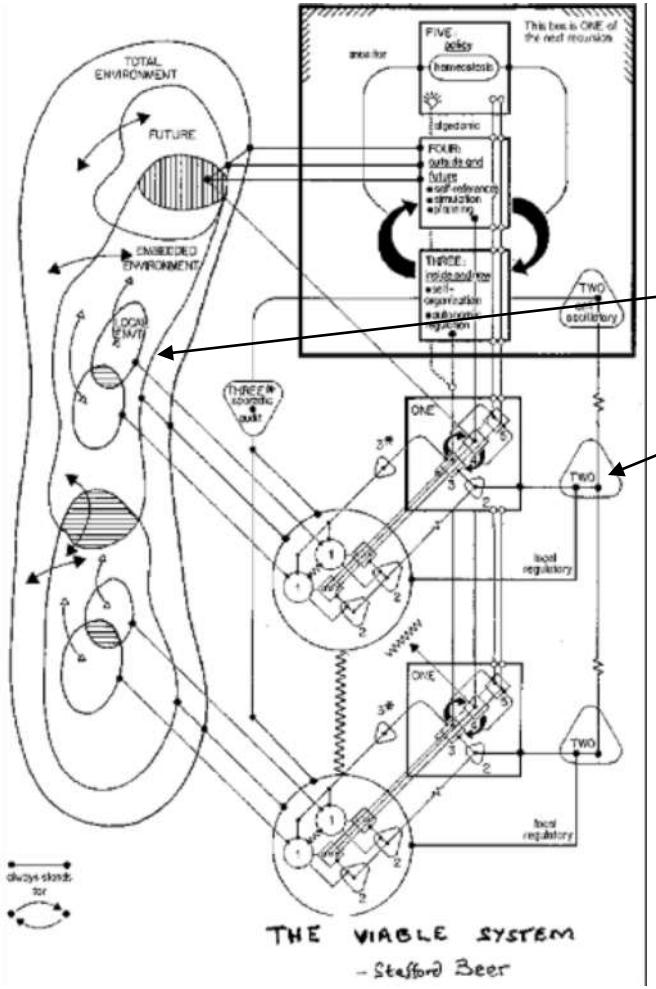
Unilever 1978 – 2006 roles include:

- Controller Unilever Foods UK ($1 billion turnover)
- 2002 – 2006 Leader Dynamic Performance Management Change Project (part of Unilever's Finance Academy)

Outside Unilever

- Chairman of BBRT 2001 – 2006
- BBRT Associate/ Non Executive Board Member 2007 -
- 2006 - Founder Director Satori Partners Ltd
- 2005 – PhD Hull University (Management Cybernetics)
- 2007 – Visiting Fellow Cranfield University
- 2009 - Publish book 'Future Ready: How to Master Business Forecasting'
- 2010 Editorial Board of Foresight Magazine
- 2011 Founder CatchBull (Forecasting Performance Management Software)
- 2017 Publish 'The Little Book of Beyond Budgeting'
- 2018 Publish 'The Little Book of Operational Forecasting'
- 2019 Publish 'Present Sense: the Art and Science of Performance Reporting, with the Brain in Mind'
- 2021 Publish 'Zen and The Art of Organising Work: The Hidden Anatomy of Effective Organisations…Using Systems Thinking to Unlock Nature's Secrets'
- 202x The Little Book of Cost Management





TRANSDUCER

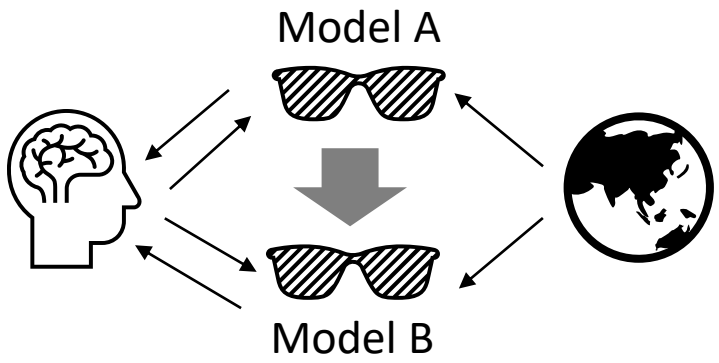
The transducer carries a message across a boundary, between a system and its environment, between departments, between management levels or among participants in a network. In each case, messages are conceived in the special language of the system or subsystem and must be transduced to another which has its own special language. The variety of the transducer must be least equivalent to the variety of the channel. A good transducer should neither amplify nor attenuate variety. A mechanical device or a human being may serve as a transducer.

'Us and them' →

In an organizational setting, the individuals who operate at the boundaries of the organization must be aware of the languages and distinctions which prevail on both sides of the boundary to be an effective transducer.

'Me' and 'you'? →

Conant Ashby Theorum



INT. J. SYSTEMS SCI., 1970, VOL. 1, NO. 2, 89-97

EVERY GOOD REGULATOR OF A SYSTEM MUST BE A MODEL OF THAT SYSTEM*

ROGER C. CONANT
Department of Information Engineering, University of Illinois
and
W. ROSS ASHBY
Biological Computers Laboratory, University of Illinois**

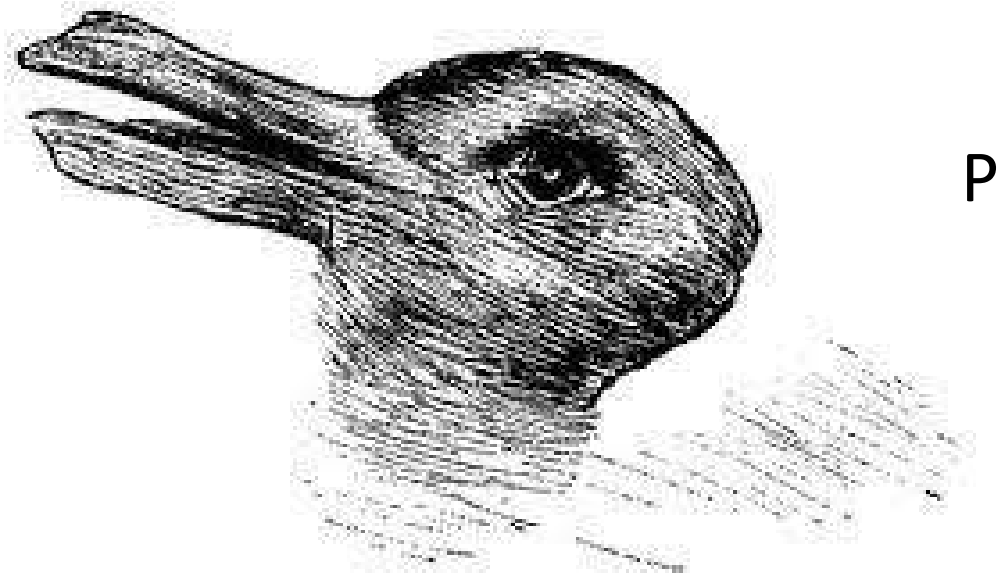
[Received 3 June 1970]

The design of a complex regulator often includes the making of a model of the system to be regulated. The making of such a model has hitherto been regarded as optional, as merely one of many possible ways.

In this paper a theorem is presented which shows, under very broad conditions, that any regulator that is maximally both successful and simple *must* be isomorphic with the system being regulated. (The exact assumptions are given.) Making a model is thus necessary.

The theorem has the interesting corollary that the living brain, so far as it is to be successful and efficient as a regulator for survival, *must* proceed, in learning, by the formation of a model (or models) of its environment.

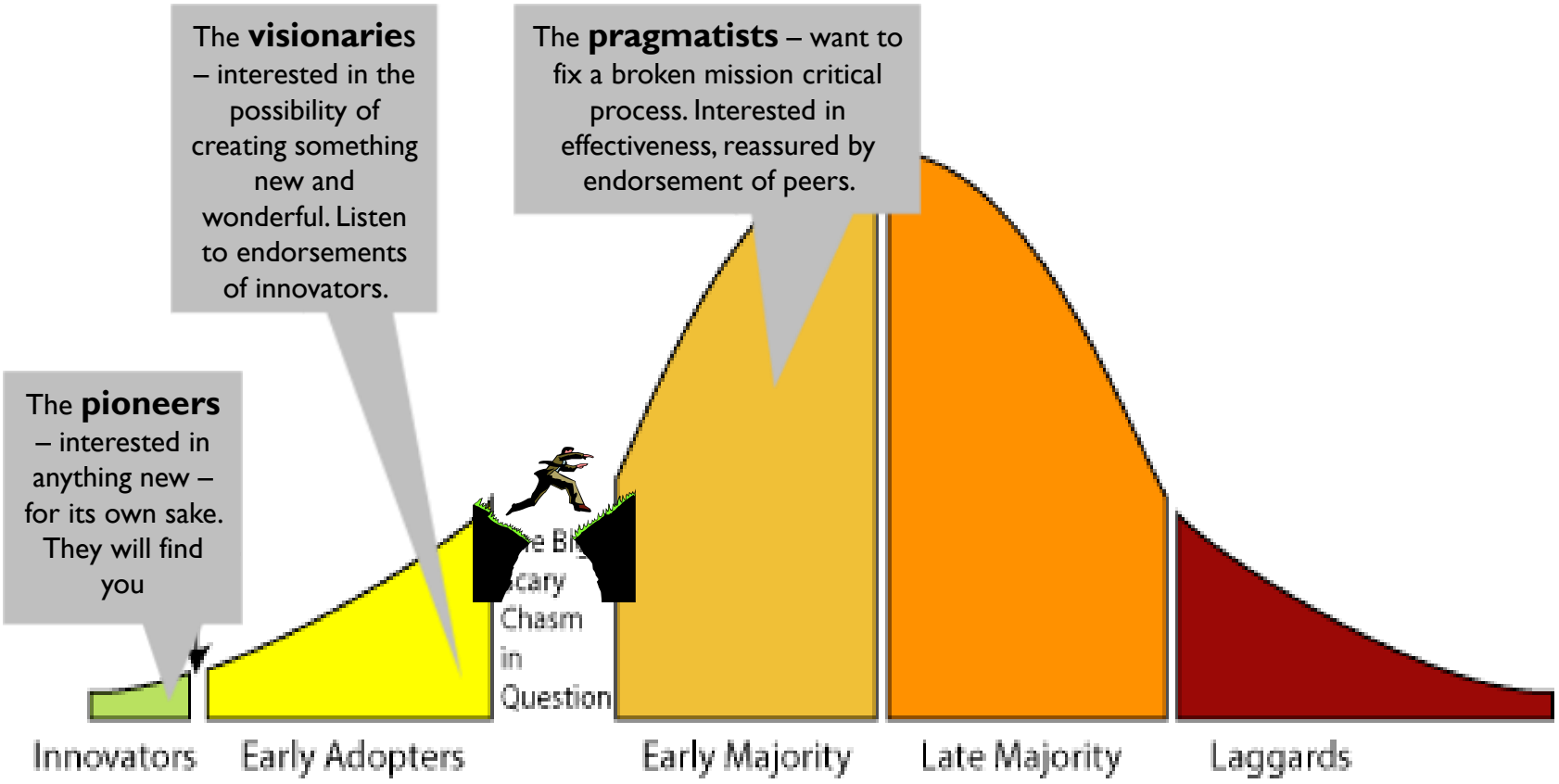
Duck or Rabbit?



Not: convincing (rational change)

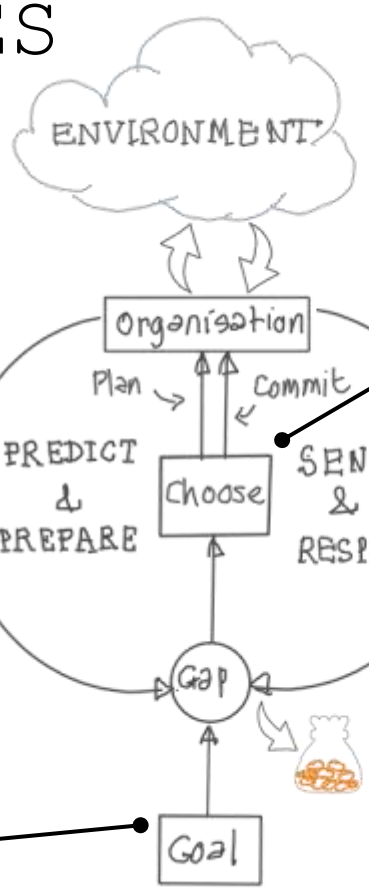
Perception (normative change)

Who is the audience?



PROCESS PRINCIPLES

…and their different PURPOSES



RESOURCE ALLOCATION

To DIRECT the FLOW of resources

PERFORMANCE EVALUATION

To determine the level of ACHIEVEMENT

REWARDING

To ALIGN the INTERESTS of the workforce

FORECASTING

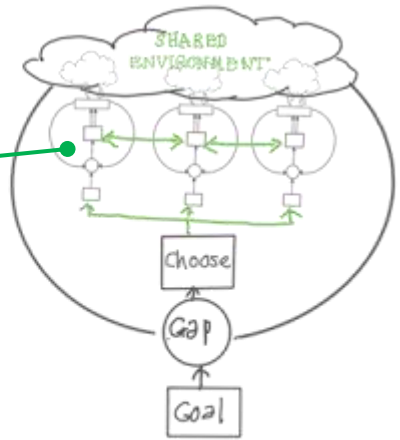
To estimate EXPECATATIONS

TARGETTING

To set ASPIRATIONS

RHYTHM

To ALIGN ACTIVITY

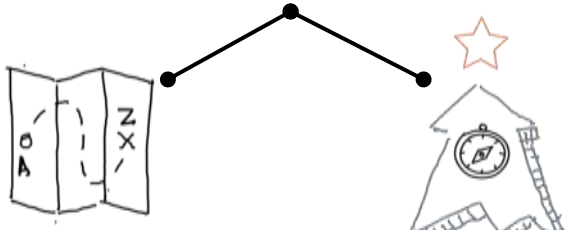


PEOPLE PRINCIPLES

…and their different ROLES

PURPOSE

Providing DIRECTION



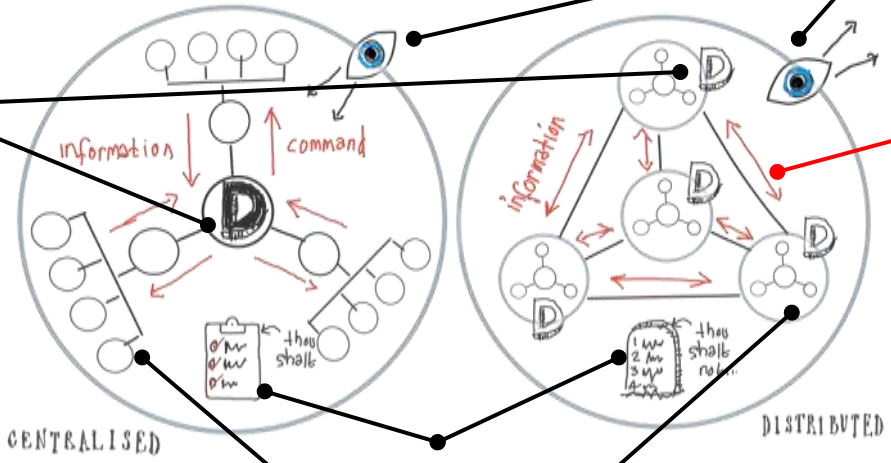
CUSTOMER

Directing ATTENTION

AUTONOMY

Allocating decision making AUTHORITY

TRANSPARENCY



VALUES

Governing BEHAVIOUR

ORGANISATION

Structuring ACTIVITY

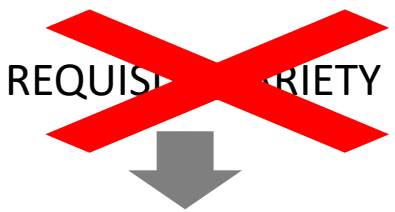
TRADITIONAL BUDGETING

Fixed, annual, detailed

- Targets
- Forecasts
- Resource allocation (budgets)

used for

- measurement (variance analysis)
- synchronisations (plans)
- rewards (Agency Theory)



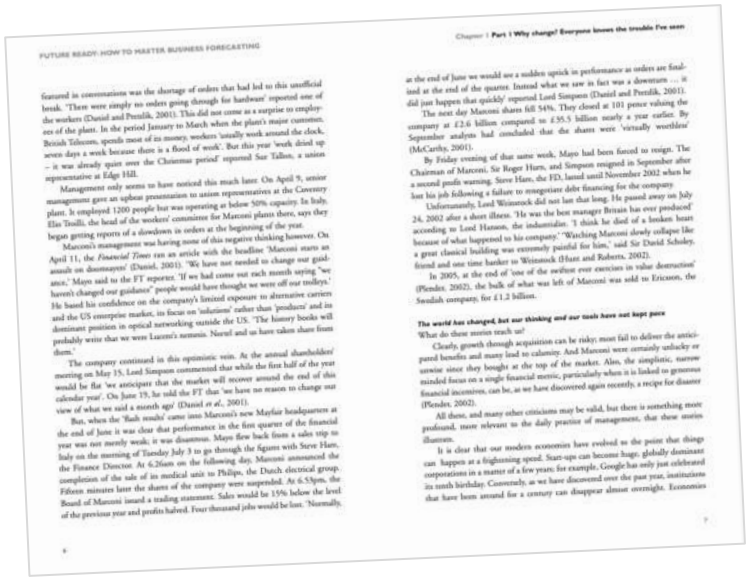
REQUISITE VARIETY

BEYOND BUDGETING

LAW OF REQUISITE VARIETY, OR ASHBY'S LAW

The Law of Requisite Variety states: only variety can absorb variety. A regulator of a system can only regulate if the variety disposed by the regulator is equal to the variety generated by the reguland. Variety regulation can be one-one, such as the players on a soccer team, or it can be one-many, such as a king and his subjects. Most regulation of variety, however, does not proceed from authority but from convention. Traffic flow, for instance, is mostly regulated by two conventions: that traffic going in one direction will stay on one side of the road leaving the other side clear for traffic going in the opposite direction, and that traffic will stop on the red light and move on the green light. Ashby said "In its elementary forms the law is intuitively obvious and hardly deserving statement-Where the law, in its quantitative form, develops its power is when we come to consider a system in which these matters are not so obvious ...when it is very large... (or) much too complex to be handled by unaided intuition."

Forecasting


FUTURE READY: HOW TO MASTER BUSINESS FORECASTING

Chapter 1 **Part 1 Why change? Everyone knows the trouble I've seen**

featured in conversations was the shortage of orders that had led to this unofficial break. 'There were simply no orders going through for hardware' reported one of the workers (Daniel and Prentik, 2001). This did not come as a surprise to employees of the plant. In the period January to March when the plant's major customer, British Telecom, spends most of its money, workers 'usually work around the clock, seven days a week because there is a flood of work'. But this year 'work dried up – it was already quiet over the Christmas period' reported Sue Tallon, a union representative at Edge Hill.

Management only seems to have noticed this much later. On April 9, senior management gave an upbeat presentation to union representatives at the Coventry plant. It employed 1200 people but was operating at below 50% capacity. In Italy, Elio Trolli, the head of the workers' committee for Marconi plants there, says they began getting reports of a slowdown in orders at the beginning of the year.

Marconi's management was having none of this negative thinking however. On April 11, the *Financial Times* ran an article with the headline 'Marconi starts an assault on doomsayers' (Daniel, 2001). 'We have not needed to change our guidance,' Mayo said to the FT reporter. 'If we had come out each month saying "we haven't changed our guidance" people would have thought we were off our trolleys.' He based his confidence on the company's limited exposure to alternative carriers and the US enterprise market, its focus on 'solutions' rather than 'products' and its dominant position in optical networking outside the US. 'The history books will probably write that we were Lucent's nemesis. Nortel and us have taken share from them.'

The company continued in this optimistic vein. At the annual shareholders' meeting on May 15, Lord Simpson commented that while the first half of the year would be flat 'we anticipate that the market will recover around the end of this calendar year'. On June 19, he told the FT that 'we have no reason to change our view of what we said a month ago' (Daniel *et al.*, 2001).

But, when the 'flash results' came into Marconi's new Mayfair headquarters at the end of June it was clear that performance in the first quarter of the financial year was not merely weak; it was disastrous. Mayo flew back from a sales trip to Italy on the morning of Tuesday July 3 to go through the figures with Steve Ham, the Finance Director. At 6.26am on the following day, Marconi announced the completion of the sale of its medical unit to Philips, the Dutch electrical group. Fifteen minutes later the shares of the company were suspended. At 6.55pm, the Board of Marconi issued a trading statement. Sales would be 15% below the level of the previous year and profits halved. Four thousand jobs would be lost. 'Normally, at the end of June we would see a sudden uptick in performance as orders are finalized at the end of the quarter. Instead what we saw in fact was a downturn … it did just happen that quickly' reported Lord Simpson (Daniel and Prentik, 2001).

The next day Marconi shares fell 54%. They closed at 101 pence valuing the company at £2.6 billion compared to £35.5 billion nearly a year earlier. By September analysts had concluded that the shares were 'virtually worthless' (McCarthy, 2001).

By Friday evening of that same week, Mayo had been forced to resign. The Chairman of Marconi, Sir Roger Hurn, and Simpson resigned in September after a second profit warning. Steve Ham, the FD, lasted until November 2002 when he lost his job following a failure to renegotiate debt financing for the company.

Unfortunately, Lord Weinstock did not last that long. He passed away on July 24, 2002 after a short illness. 'He was the best manager Britain has ever produced' according to Lord Hanson, the industrialist. 'I think he died of a broken heart because of what happened to his company.' 'Watching Marconi slowly collapse like a great classical building was extremely painful for him,' said Sir David Scholey, friend and one time banker to Weinstock (Hunt and Roberts, 2002).

In 2005, at the end of 'one of the swiftest ever exercises in value destruction' (Plender, 2002), the bulk of what was left of Marconi was sold to Ericsson, the Swedish company, for £1.2 billion.

The world has changed, but our thinking and our tools have not kept pace

What do these stories teach us?

Clearly, growth through acquisition can be risky; most fail to deliver the anticipated benefits and many lead to calamity. And Marconi were certainly unlucky or unwise since they bought at the top of the market. Also, the simplistic, narrow minded focus on a single financial metric, particularly when it is linked to generous financial incentives, can be, as we have discovered again recently, a recipe for disaster (Plender, 2002).

All these, and many other criticisms may be valid, but there is something more profound, more relevant to the daily practice of management, that these stories illustrate.

It is clear that our modern economies have evolved to the point that things can happen at a frightening speed. Start-ups can become huge, globally dominant corporations in a matter of a few years; for example, Google has only just celebrated its tenth birthday. Conversely, as we have discovered over the past year, institutions that have been around for a century can disappear almost overnight. Economies

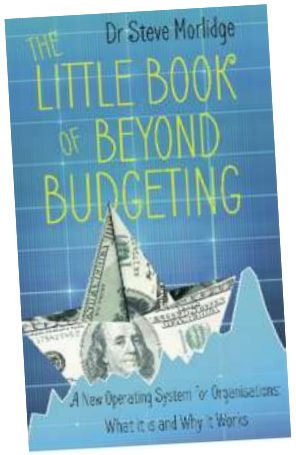
Key messages

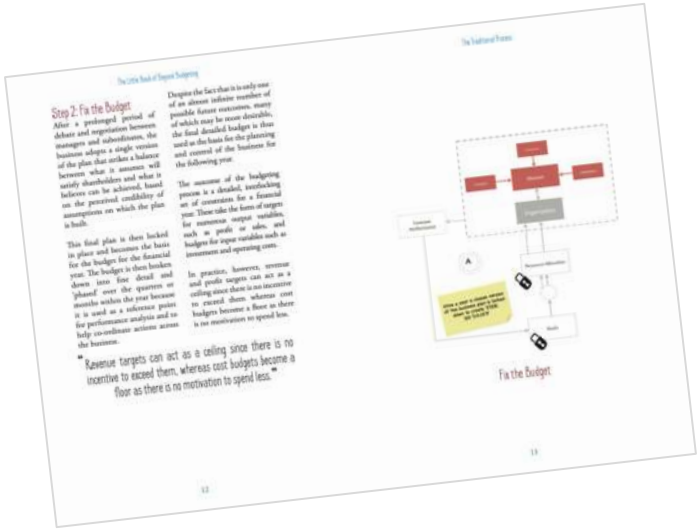
- start with PURPOSE – to make decisions (future actuals) not predict (reflexivity)
- TIME (Requisite Variety)
  - horizon reflects latency in the system
  - frequency – rate of change in the environment
- MODELS (Ashby Conant)
  - can be statistical/mathematical or judgemental
- MEASUREMENT (feedback)
  - good enough for the purpose
- RISK (redundancy)
- PROCESS (low variety)

Approach

- start with a recognised problem to be solved
- mainly text
- appeal to intuition – everyday examples e.g. regulation
- explicit cybernetic discussion at the end

Holistic Perspective (for leaders)





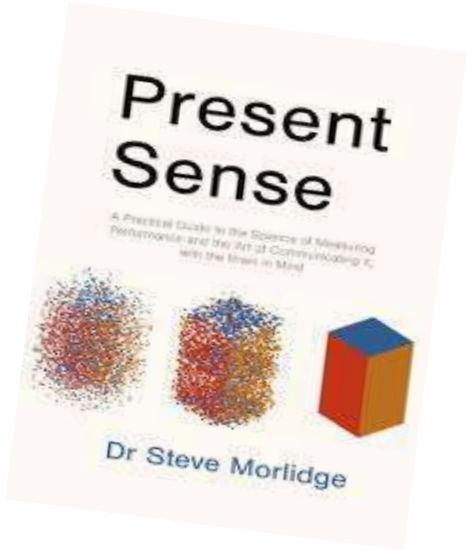
Key messages

- Systematic behaviour is the product of the way that the system is designed
- Traditional budgeting is not flexible and promotes dysfunctional behaviour
- The reason is that is breaks a fundamental systemic law (Ashby's LORV)
- Becoming more adaptive demands that you address how people are managed at the same time
- Learn form others but don't copy/paste

Approach

- format based on target audience – senior leaders
- short – capable of being read on a short hail flight
- small – capable of being carried in a pocket or small bag
- journalistic, pragmatic, no waffle, don't patronise, use graphics
- appeal to beliefs/experience
- Smuggle control theory in

Performance Evaluation and Targeting: 1/2



PERFORMANCE ANALYSIS

Key messages:

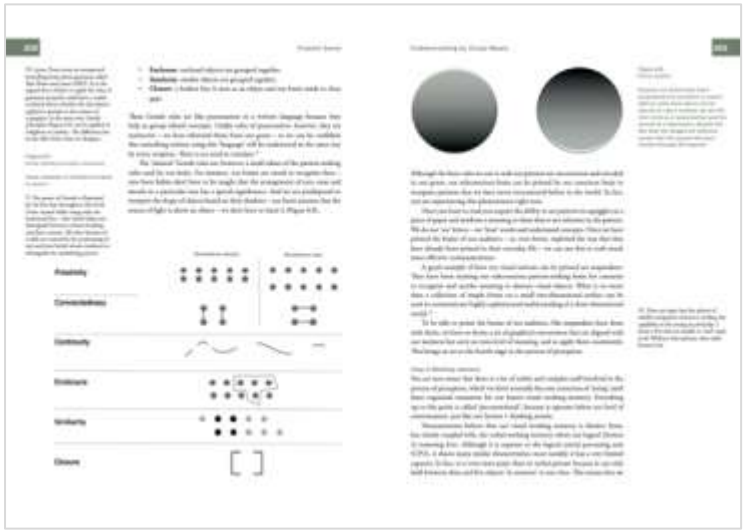
- Required to inform interventions
- We have same problem as the brain: need to attenuate variety intelligently
- We should use the same strategy as the brain – models of the world and active learning driven by prediction errors, informed by
  - trend analysis
  - control charts

TARGETING

Key Messages:

- There are many way to set targets
- Traditional approaches – SMART – too low variety -> failure
- Use them mindfully

Performance Reporting: 3/4



REPORTING

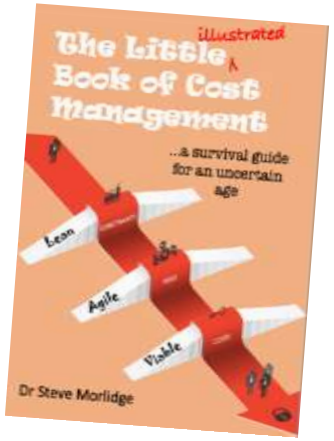
Key messages:

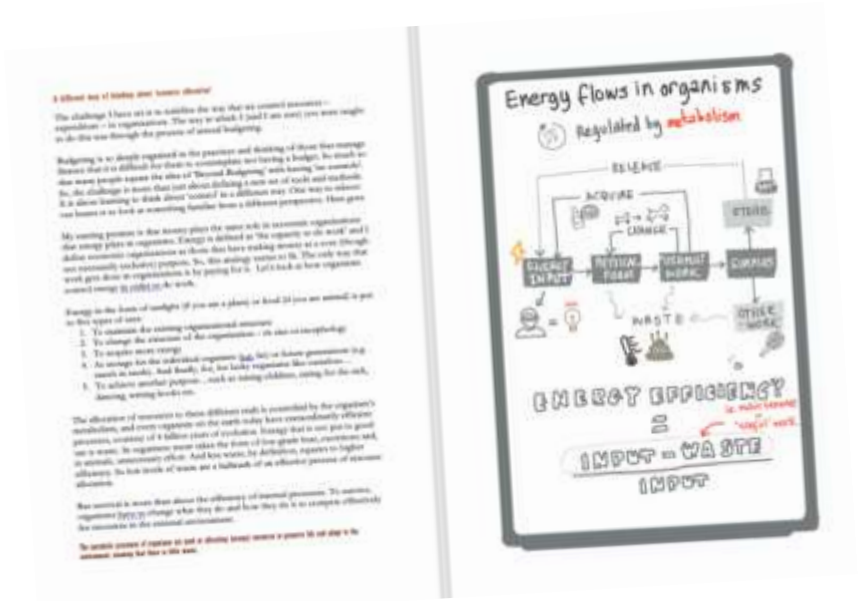
- To be effective (speed, faithfulness and consistency) communication
  - has to take account of the models and processing styles of the audience
- Human beings are visually biased
- We share the same neural equipment which is well understood
- Need to apply scientific principles to design of ‘reports’

Approach:

- Exploit interest in data visualisation, and groundwork or Tufte, few etc, already known to IT professionals
- Implicitly frame the challenge in cybernetic terms
- Apply it to ‘problems’ identified by Beyond Budgeting
- Explain using cybernetic principles (implicit)
- Use very high ‘production values’
- NO reference to triple index, Bayesian filters etc as promoted by Beer

Regulation of Costs (not yet published)





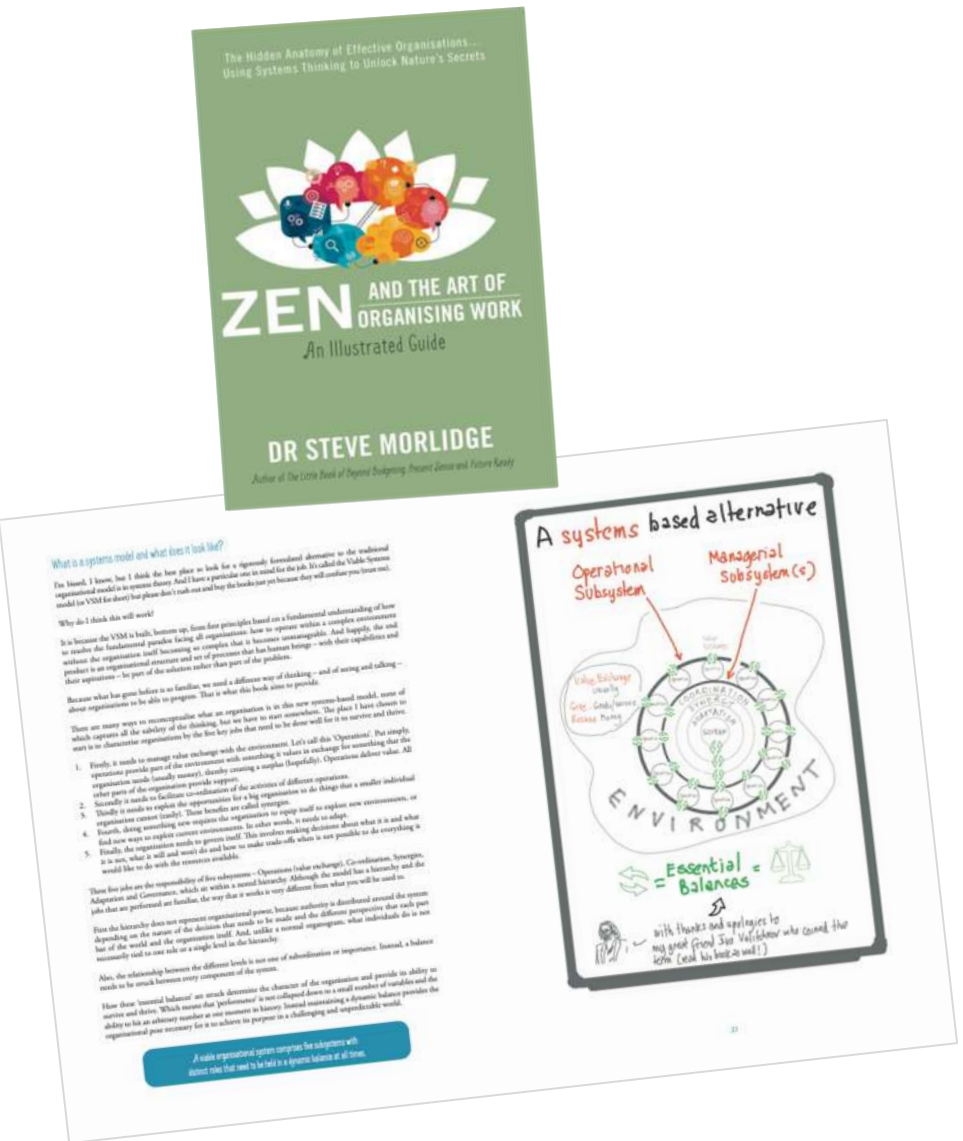
Key messages

- Money = the ability to do work = energy
- 'Controlling' money is about regulating its flow within the organisation and with the environment
- Start with 'what is the best way to work' and then add regulatory systems
- Process = efficient flow = 'Lean' = align internal/external variety
- Projects = (often) S4 'exploratory' = acquisition of knowledge/uncertainty (variety) reduction
- importance of redundancy

Approach

- start with cybernetic approach to organising work
- small book
- 'bite size lessons' with hand drawn graphics (pseudo didactic/multi channel)

Holistic Perspective (for system thinkers)



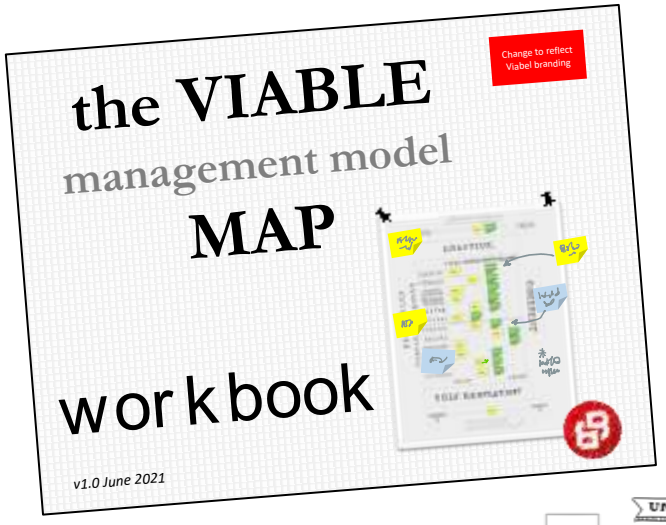
Key messages

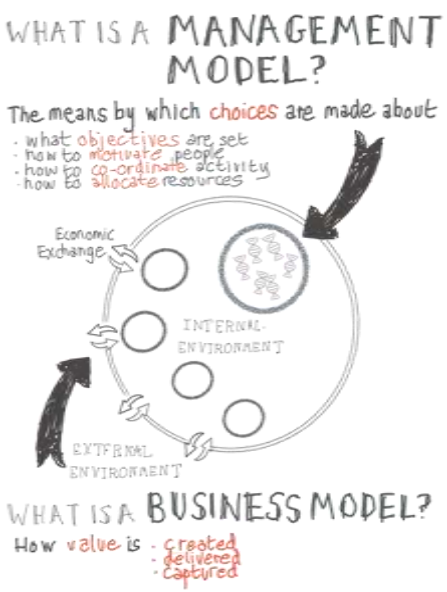
- Organisations are necessary to exploit division of labour
- Complexity grows exponentially with size – limits to growth
- Ashby's Law accountancy for complexity
- Key to success is achieving balance in LORV terms between sub systems and their internal/external environment ('Essential Balances') though:
- How activity is structured
- How information is used to regulate the system(s)

Approach

- small(ish) book
- 'bite size lessons' with hand drawn graphics (pseudo didactic/multi channel)
- position VSM graphic as a 'dissected' organism
- position book as gateway to esoteric but deep and fundamental knowledge

Operationalising Beyond Budgeting (WIP)





Key messages

- A Business Model is a description of the structural relationships between its value creating operation and its environment
- A management model is the complementary construct for the internal relationships
- Because it is the sea ‘in which we swim’ it is difficult to ‘see it’
- The 12 BB principles identify the dimensions of a Management Model
- The ‘Map’ show users how to use them to articulate their current reality, diagnose problems and design a better model.
- To be ‘viable’ it needs to be internally coherent and a good fit to the environment

Approach

- picture book
- System 3-2-1 complex positioned as a management model
- Main use is practical not didactic
- Core concept of ‘coherence’ is a disguised Ashby’s Law.

Final thought:

Me

CHANNEL CAPACITY

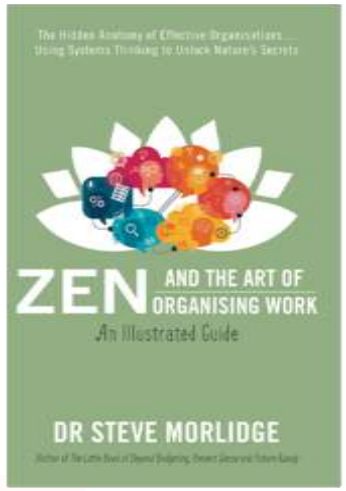
The capacity of a communication channel refers to the amount of information it can transmit in a given period of time. It must be able to distinguish the number of states (or the variety) it is to transmit and it must be able to do so in the time allotted. In a discrete channel such as a telegraph wire, the capacity is spoken of in terms of the " logarithm of the numbers of symbols of certain time duration... the number of such symbols handled . . the amount of information transmitted per second, using bits per second as a unit." The needed amount of channel capacity can be figured accurately for Morse code or teletype.

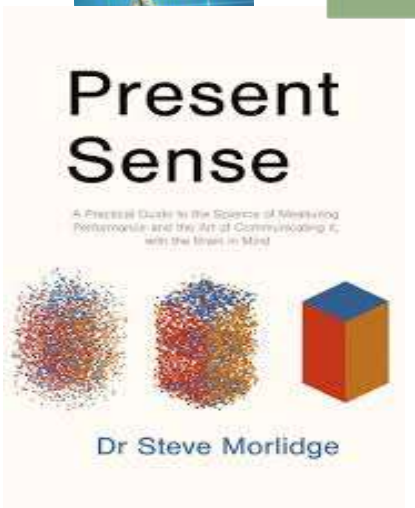
You?

AMPLIFICATION

When a signal is amplified it is increased in one of a number of ways. It may simply be louder - as when the sound of a musical instrument is picked up by a sound system. It may be more widely distributed, increased in effectiveness or extended from the specific to the general case or accomplished in a shorter period of time. In many cases, the signal to be amplified is masked by noise or blended in with other information. In these cases, amplification involves a selection of one signal from among many before it is enlarged.

Questions?





also available on

Google Play

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