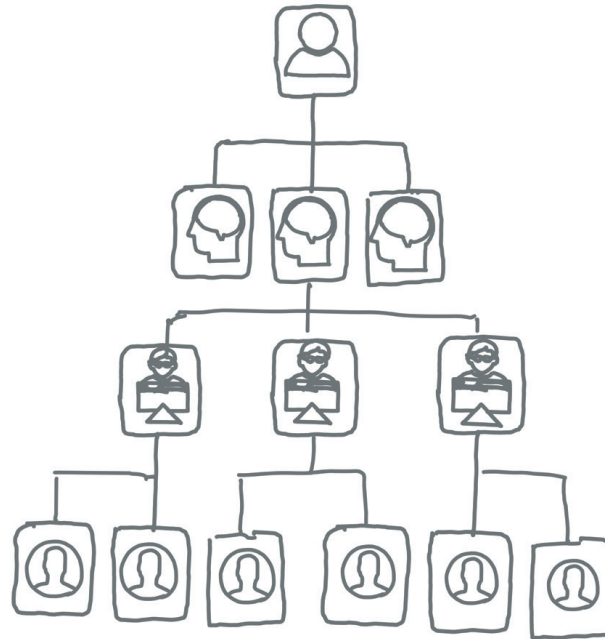


For example, if someone asked you to describe your organisation you would probably end up drawing something that looks like this:



If you think about it, an organisation chart tells you very little about what actually goes on – for example the outside world of customers doesn't feature at all. And it tells us NOTHING about the way things *should* be done. The organisation chart for the most successful businesses and the very worst will look pretty much the same.

So, this book is primarily aimed at anyone who is a leader of an organisation or part of one, and anyone (currently) in a less privileged position who wants to learn and to grow.

Hopefully, what you will learn in this book will help you to think about organisations in a different way. It will support or challenge your intuition and provide you with an explanation for why some things work and others don't. And it is a 'thinking toolkit' filled with the conceptual equivalent of garden rakes, spades and pruning shears; tools designed to help with the unique challenges of nurturing a living organisation.

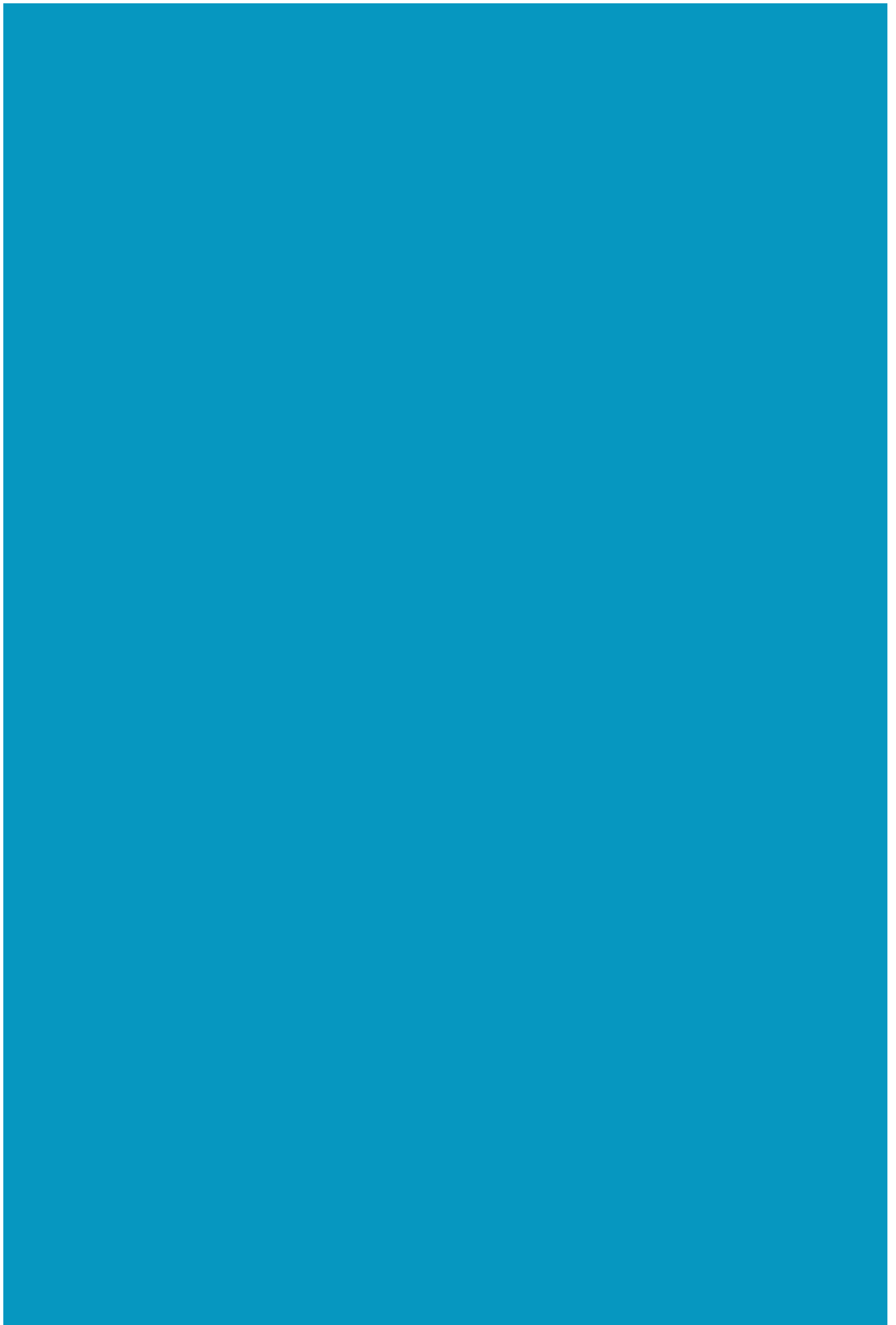
It will help you to understand and describe them using a new language. It will also help you diagnose problems with existing organisations and help you fix them or design better ones.

The majority of the book is given over to understanding and description but there are clues throughout it which will hopefully help you diagnose and design.

There is also a bias towards finance, which reflects my background and experience. But I don't feel too guilty about this because money is a direct analogue to energy without which no kind of organisation could survive. It is the only way that the tendency to disorder (entropy) can be held at bay. And the broken processes that myself and my fellow finance practitioners have imposed on organisations over the last century are a root cause of much of the dysfunctionality that we experience at work today.

Finally, an apology is in order to those many fellow travellers in the Systems and Cybernetics communities who have devoted as much, or more, of their life to studying and talking about these matters as I have. The sophistication of Stafford Beer's thinking is such that there are inevitably many different ways of interpreting his work, most of which will diverge with mine at some point.

I hope that whatever success I have in introducing newcomers to his work will outweigh any sins I have committed along the way.



INTRODUCTION

...in which we explore the key characteristics of organisations

What are organisations?

Organisations are everywhere – you can't get away from them.

Plants and animals are biological organisations made up of cells.

And then there are many kinds of social organisations – families, clubs, friendship groups, and national states are all organisations, made up of (the contributions of) people not cells.

Social organisations vary a lot. But there is one sure fire way of finding out whether you are in one. Try breaking a rule. If you are expelled, and you are ostracised by people you used to hang out with, you used to be part of an organisation, and now you are part of its environment. Codes of behaviour, some of which may be written down but most of which won't be, are what organisations are made up of.

So being part of an organisation requires an individual to relinquish some of their freedom to act – their behaviour is constrained in some way. That's what it means to be organised – you could have done anything, but – just like your liver – you have chosen (or been allowed) to do just 'x'. The only fundamental difference between you and your liver is that biological organisations exist in physical space whereas social organisations inhabit conceptual space, and that you have a choice.

But being part of an organisation isn't just an exercise in self-denial. Within the boundaries of the organisation members enjoy a sense of belonging – collective identity – and you sign up to the organisation's reason for being – an implied purpose.

This book is primarily focussed on economic organisations. The people who join these also enjoy another form of compensation for their loss of freedom called a pay cheque. Economic organisations also have a legal status and are generally run in a more formal way than many other forms of social organisations. And, by definition, they need to be financially viable in order to survive, even if making money is not the intended purpose of the organisation.

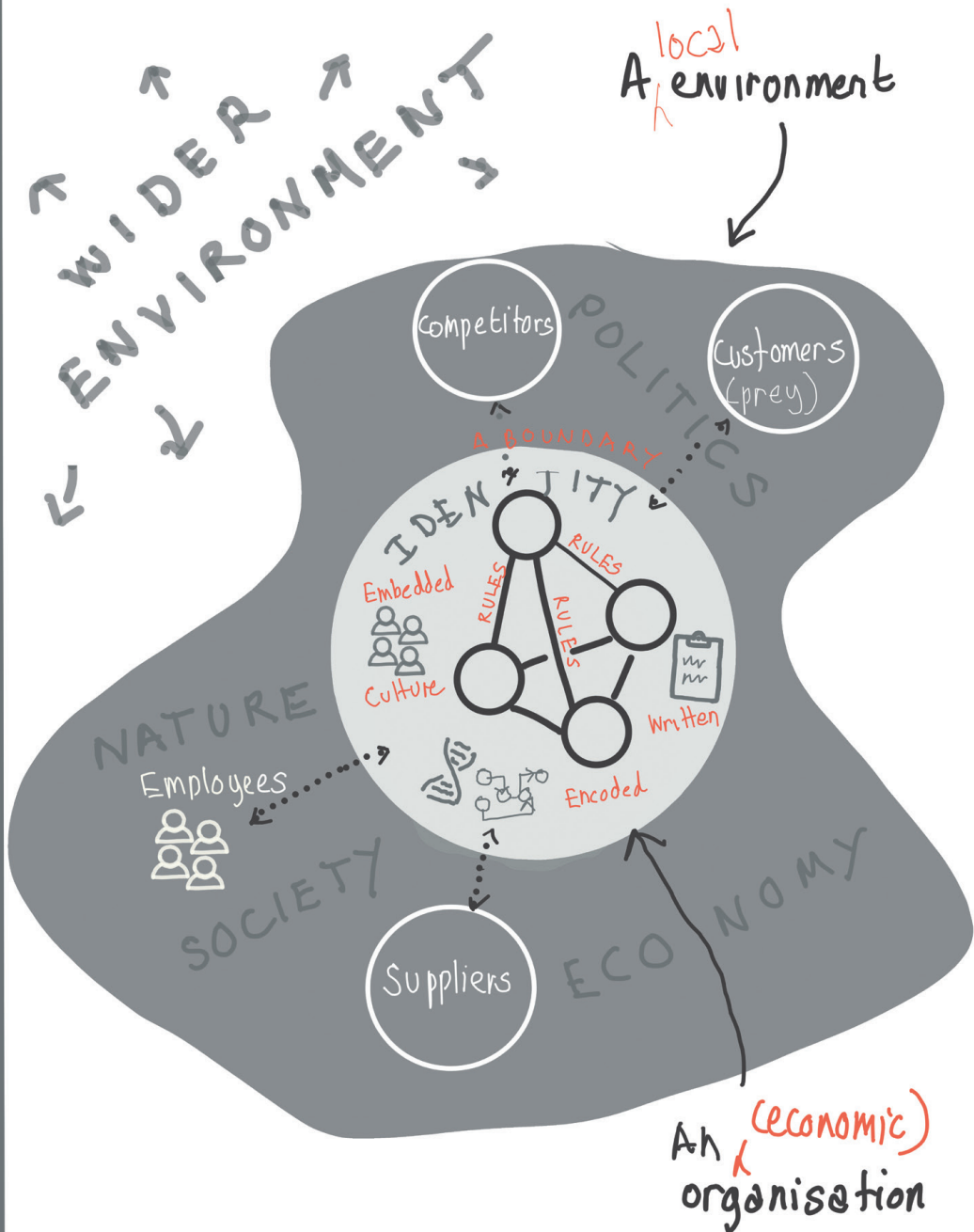
But no matter how structured and formal the organisation there will always be informal, unwritten rules, rights and obligations that inform the behaviour of its members. Collectively, these form 'the culture' of an organisation.

Tangible rules and structures help shape the culture of an organisation. But culture also affects the way that explicit rules are interpreted and applied. Any parent knows that the word 'don't' means different things to different children.

If you are running an organisation, the question is do you just allow these things to happen – which they will whether you want them to or not – or do you consciously try to design structures and processes to do the job you need them to do? If so, where do you start?

An organisation is a collection of entities whose activities are ordered in pursuit of an implied purpose.

biological and social
All types of organisations
have the same features



Why we need organisations.

The economic textbooks are clear. Way back in the 18th century Adam Smith said that it makes sense to specialise. That's why we have organisations.

On a visit to a pin factory, he observed that groups of people each focussed on a subset of all the potential pin making tasks produced more than a group of individuals who each perform every task. This is 'division of labour', an important source of 'economies of scale'. And as the industrial revolution progressed, by employing large costly machines to replace people the benefits of specialisation became even greater.

Of course, the individual makers of bits of a pin could ply their trade as individuals and trade their surpluses in a marketplace rather than joining an organisation. So, economies of scale can't explain everything.

Enter, in 1937, Ronald Coase, who told us that transaction costs across organisational boundaries are higher than those within because trust is lower, and so the cost of enforcement is higher...which is why we have firms rather than just markets. This applies whether the transactions involved are physical goods or intangible transfers, in the form of services or the exchange of knowledge.

So, although it may be that all the things you need to get something done exist somewhere in the world, it may be either logistically difficult or financially costly to achieve your goals through networks or contacts. You need an organisation.

But economies of scale don't just flow from internal factors. As an organisation grows it acquires external power, in the form of the ability to influence consumers or strike better deals with suppliers, for example.

So, organisations exist because size and belonging bring efficiencies...so the theory goes.

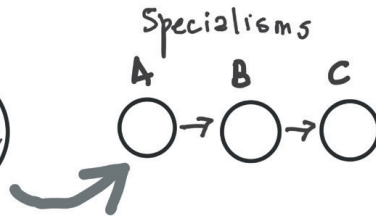
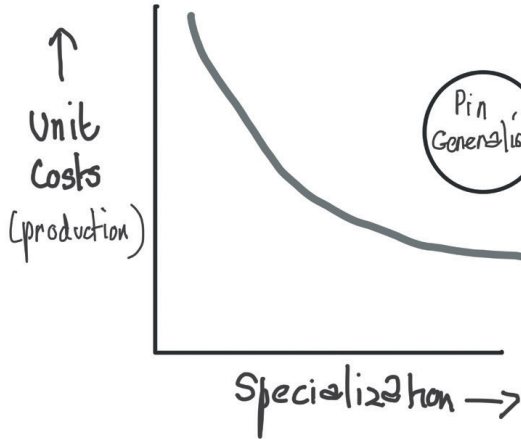
Organisations create wealth by enabling goods and services to be delivered more efficiently than would be possible by a group of independent individuals.

Why do we need organisations?

1 Specialisation

One sort of (Economies of Scale)

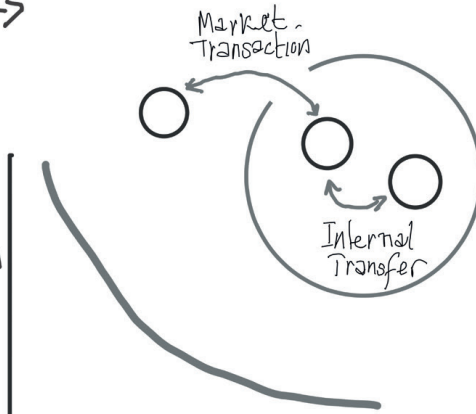
Adam Smith



Ronald Coase



↑ Transaction Costs



2. Transaction Costs

Outside ← Location → Inside
Low ← Trust → High

What makes an organisation effective?

So, organisations are more efficient than groups of individuals exchanging whatever they have spare. Put crudely it will make more money. But is it just a matter of efficiency? What about effectiveness?

Organisations often claim (espouse) to have a purpose – or a reason for existing. But in practice what an organisation actually does – its enacted purpose – can be different.

The extent to which an organisation achieves what it sets out to do is the measure of effectiveness. We usually call this 'performance'.

For example, if you buy a sports car you would describe its performance in terms of top speed and acceleration. But if you buy a people carrier to transport your little bundles of joy around, safety, fuel economy and its ability to accommodate lots of baby stuff may be what you look for. Both are vehicles that have four wheels and an engine, but they are built for different purposes, so we judge performance differently.

Whatever its espoused purpose, an organisation has to be economically viable – in perpetuity – because if it isn't it won't be around to fulfil its purpose.

This means that, in the same way that a car has to have a fuel tank big enough to get it to the next filling station, an organisation must ensure that it consumes no more money than it gets from its sources of money – customers, donors, lenders, shareholders etc.

But, here's the thing. To the people providing the money, your organisation serves a different purpose. Theirs!

This purpose may be purely practical, like food. It could be aesthetic, like cool sneakers. Or to others, like shareholders, your organisation could be an investment – a source of money in the future. Organisations survive by doing things that other people value enough to be prepared to pay for.

This value exchange is the source of an organisation's viability. If this fails, the organisation will die – go bankrupt.

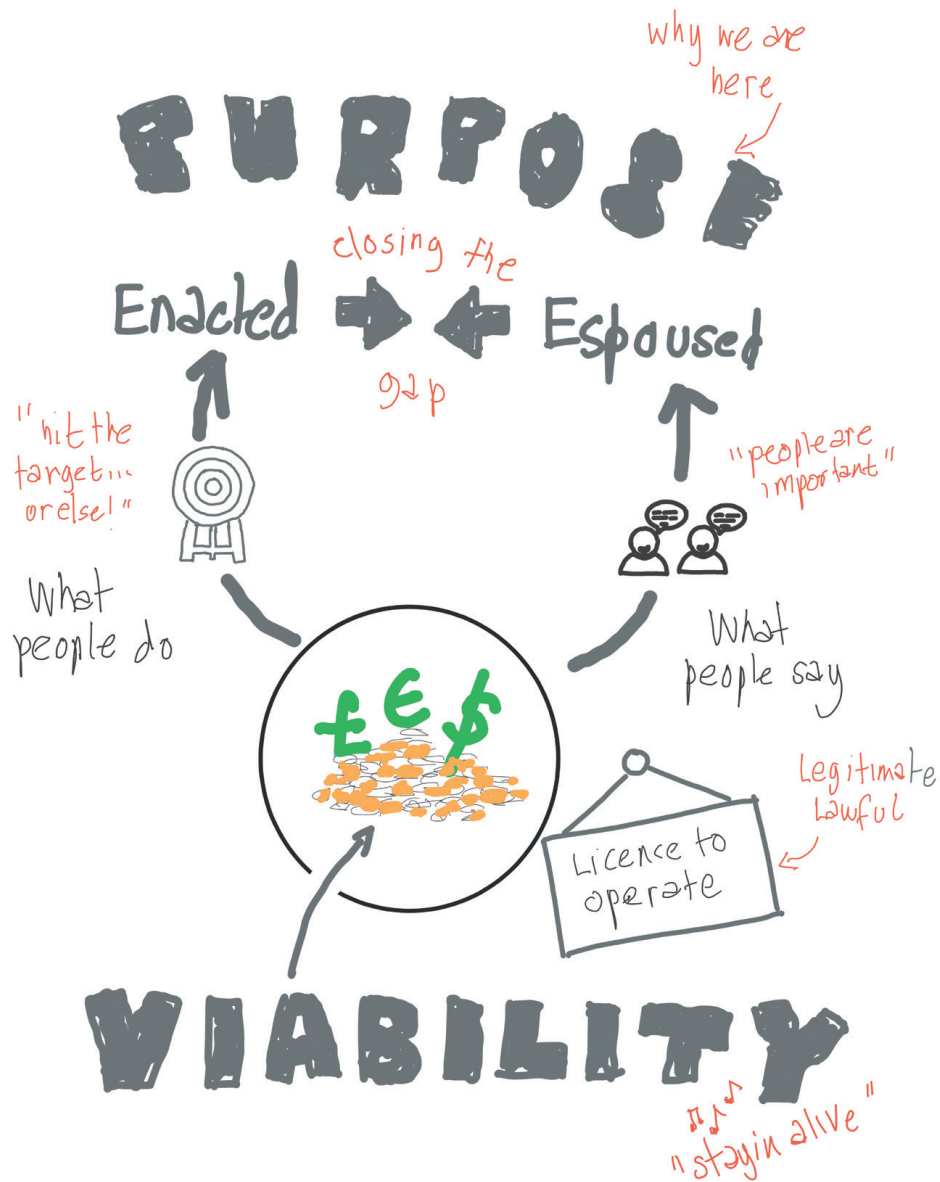
But viability is about more than just taking enough calories on board. It has to be able to perform many other organisational tasks (which we will learn more about later) adequately.

And there is also always the risk of being eaten if the owners of the organisation think they could extract more value if they let a predator consume it. So, in a capitalist economy, 'staying alive' means that you have to run at least as fast as the other potential food sources, who are all working out, just like you. Organisations face the same evolutionary pressures as any natural organism, but the time scales are usually much shorter.

So, efficiency and effectiveness aren't mutually exclusive, they are prerequisites for the existence of any organisation.

An effective organisation is one that fulfils its (espoused) purpose and to do this it must be viable: have the capability to maintain its (economic) independence indefinitely.

What makes an organisation effective?



How much 'organisation' is required?

OK, let's start organising. What does that actually mean?

For the behaviour of people to be 'organised' there must be a degree of order. And the existence of order means that they will have surrendered some of their freedom to act independently.

But this isn't an 'all or nothing' thing. The degree of order imposed by an organisation varies a lot, as do the means used to achieve it.

At one extreme the degrees of freedom can be very small.

Business examples of this are car manufacture and civil engineering projects such as bridge building, which have highly defined specifications and processes.

In other organisational domains, tank warfare and totalitarian states maintain a high degree of order (tightly coupled behaviour) through (centralised) command and control.

At the other extreme, much of the activity in some organisations is only loosely co-ordinated, such as in universities or barristers' chambers. Guerrilla warfare and liberal economies are also less tightly regulated.

What is organised and how is partly a matter of choice, but the nature of the environment is also crucial. Highly ordered behaviour is difficult to sustain in a chaotic environment. But discipline may be essential to prosper in a highly structured environment.

Choosing what needs to be ordered, what form it takes and how this order is maintained is the fundamental challenge faced by organisers. And it starts with an understanding of the nature of the organisations' chosen environment.

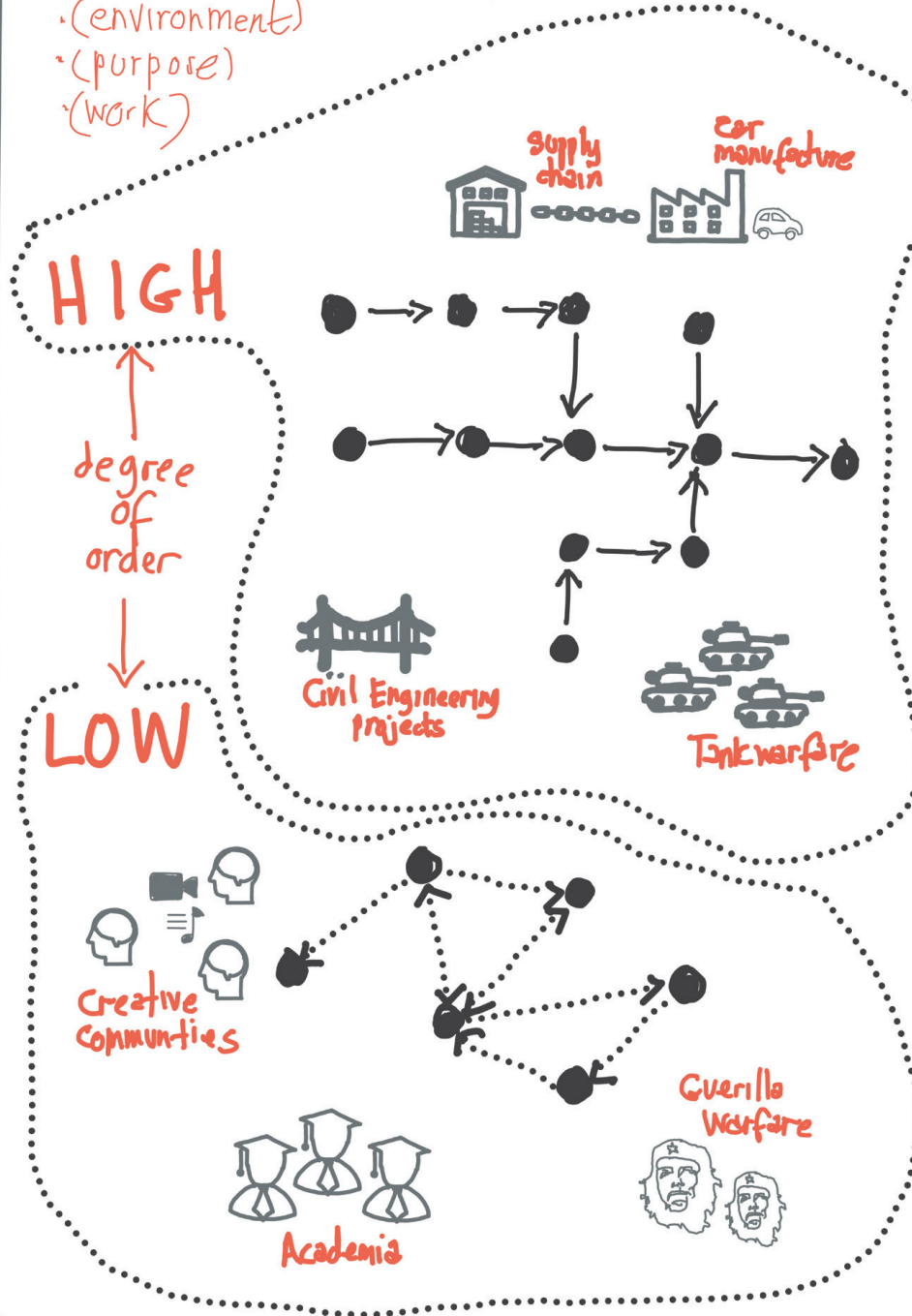
Different types of organisations require different degrees of order depending on their purpose, the nature of the environment and their activities.

What does it mean to be

"organised"?

Degrees of freedom = f of:

- (environment)
- (purpose)
- (work)



Different types of environment

Having a clear purpose is important, but the thing that has the biggest impact on organisation and what it needs to do to succeed is the nature of the environment...those things outside its boundaries that impact it.

For example, your organisation might interact with a few entities – people or other organisations – or with many. And what they look for from your organisation could be simple and straightforward or difficult to define. Window cleaners have an easier time of it than doctors. And the cast of actors and their needs could be stable over time or they could change dramatically and quickly in an unpredictable way. As can the actions of competitors, legislators and so on.

David Snowden's Cynefin model is a useful way to help you think about the 'causal texture' of an environment (or any other kind of system) and the implications for ways of thinking and acting.

A simple environmental domain is stable and the relationship between cause and effect is clear. It is well understood and interactions can be managed using simple operating procedures: '*best practice*'. In normal circumstances commodity markets are often like this, for example.

In a complicated domain it is more difficult to work out what to do because the relationship between cause and effect is less obvious. With experience you can build a repertoire of *good practice* to guide actions, most of the time. Mature manufacturing and retail businesses often operate in this kind of environment.

A complex domain is more confusing. It is difficult to work out what to do in advance because the relationship between cause and effect is opaque. Here you have to learn what to do by taking action (based on a hypothesis). In time a 'good enough' solution will emerge, perhaps in the form of heuristics (rules of thumb) that can act as a guide to future action. If you are just starting out or you move into new markets with new products you are likely to find yourself dealing with this kind of complexity.

Finally, there is the chaotic domain. Leisurely reflection isn't an option here. Instead, rapid action is needed to make the situation manageable, drawing on intuitions honed by experience of similar situations. The 2008 financial crash is an example of a chaotic environment.

In practice, however, organisations are often ignorant of their environment or unaware of the importance of understanding it. To such organisations the world is effectively disordered.

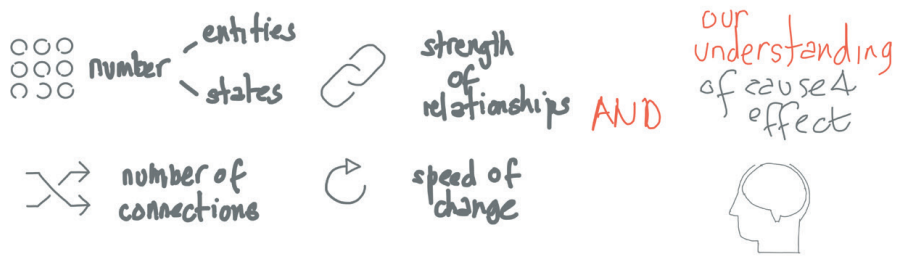
The nature of the environment has a big impact on how you should run your organisation. In practice, an organisation could be faced with different kinds of environments in different places. Clearly it would be dumb to try to impose the same kind of structure and processes everywhere.

Wouldn't it?

Environments range from the simple to the chaotic. Different environments
(and problems) need to be approached in different ways.

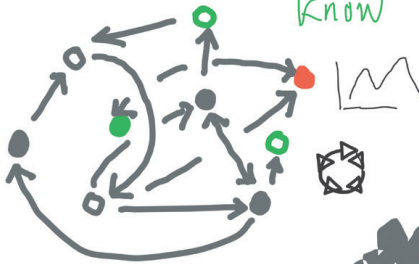
Different types of environment ^(system)

Driven by

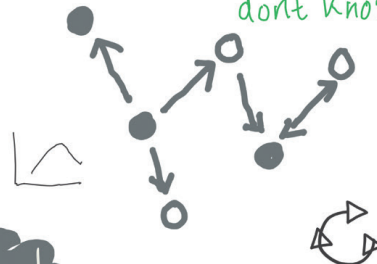


CYNEFIN MODEL

Complex (economy)
 don't know what we don't know



Complicated (car)
 know what we don't know

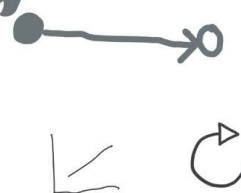


Disordered

Chaotic (crisis)
 don't know whether it is possible to know



Simple (light switch)
 know what we know



Some problems of traditional organisations.

So, you have a sense of your organisation's purpose and of the kind of environment it operates in. How do you decide how best to organise yourself?

Unfortunately, the shop of organisational models traditionally only sells one kind and it's really difficult to have it altered to fit your needs. It is a very simple and powerful organisational concept called a functional hierarchy, and its most well-known manifestation is the organisation chart. It is such a ubiquitous feature of management practice that it is sometimes difficult to even think about organisations in any other way.

The hierarchy is based on jobs and the distribution of power – the ability to make decisions. People in jobs higher up in the hierarchy have more power over almost everything and everyone below them because we assume (even if we don't realise it) that they have the knowledge and ability to make the best decisions.

Within the hierarchy, roles are grouped around functional specialisms – sales, marketing, finance, production etc – because we assume (even if we don't realise it) that exploiting economies of scale will lead to the best outcomes.

Building an organisation using a traditional functional hierarchy might be right way to go...if the environment is homogenous and relatively predictable and the work requires a high degree of specialisation with little need for collaboration.

And it is almost always the easiest thing to do because a plethora of methodologies and processes have evolved to support this traditional management model.

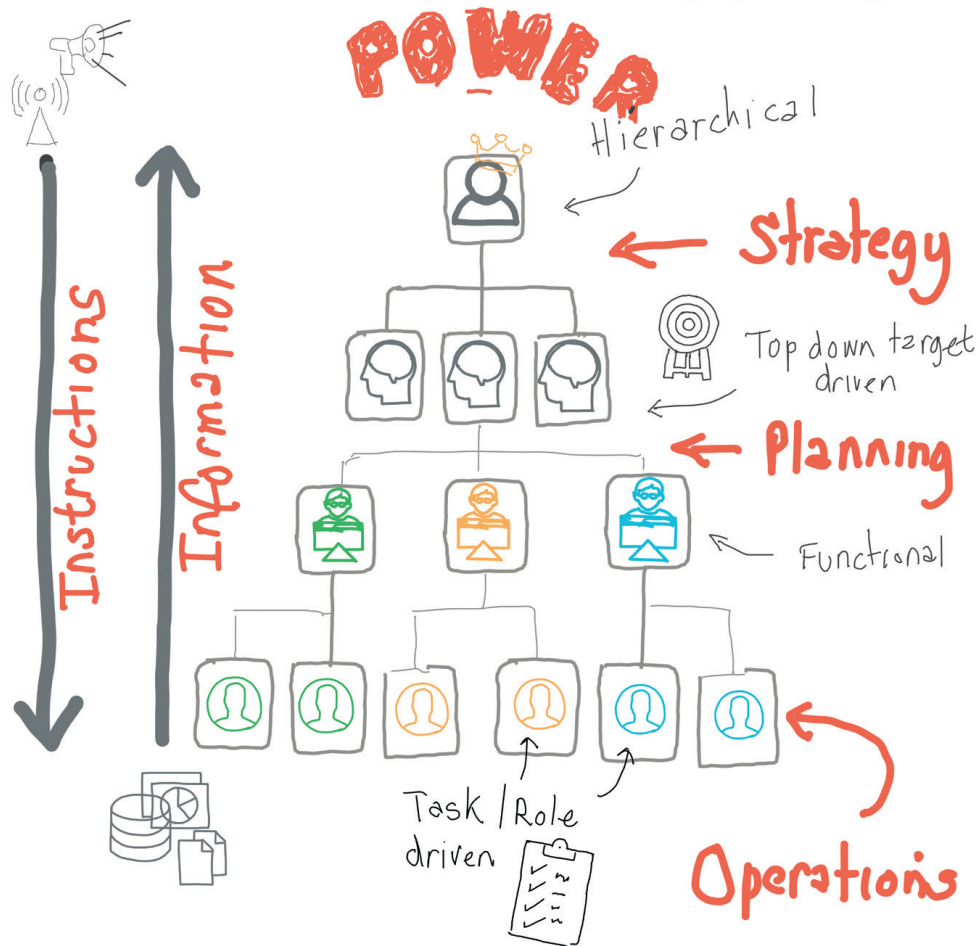
But in more challenging environments the complexity of managing an organisation can be overwhelming and it is difficult to flex the traditional model to make it better able to cope.

The fundamental problem with the traditional organisation model is its inability to deal with complexity.

Traditional organisations work best when the world is predictable and a high degree of task specialisation is required, but they struggle to deal with complexity.

How a traditional organisation works

...and when it doesn't



OK if

- ✓ predictable world
- ✓ highly specialised work

What types of complexity does an organisation deal with?

If you are looking for an organisational model that can handle complexity what should it be able to do?

It needs to cope with two different sources of complexity.

There is the complexity of the external environment, which we have already talked about. But there is also the complexity of the internal environment.

The external facing bits of the organisation deal with external complexity. Internal complexity is a challenge for management.

This is partly driven by the complexity of the environment that the organisation is attempting to respond to, but internal complexity is also generated by the organisation itself.

The more that an organisation specialises to reap the benefits of economics of scale, the greater the need for (and difficulty of) co-ordination horizontally – i.e., between functional units.

The natural response to this – if you think in a traditional way – is to place the units under the control of a single boss. But that introduces another hierarchical layer which increases the need for (and difficulty of) vertical co-ordination.

So, we are trapped in a paradox.

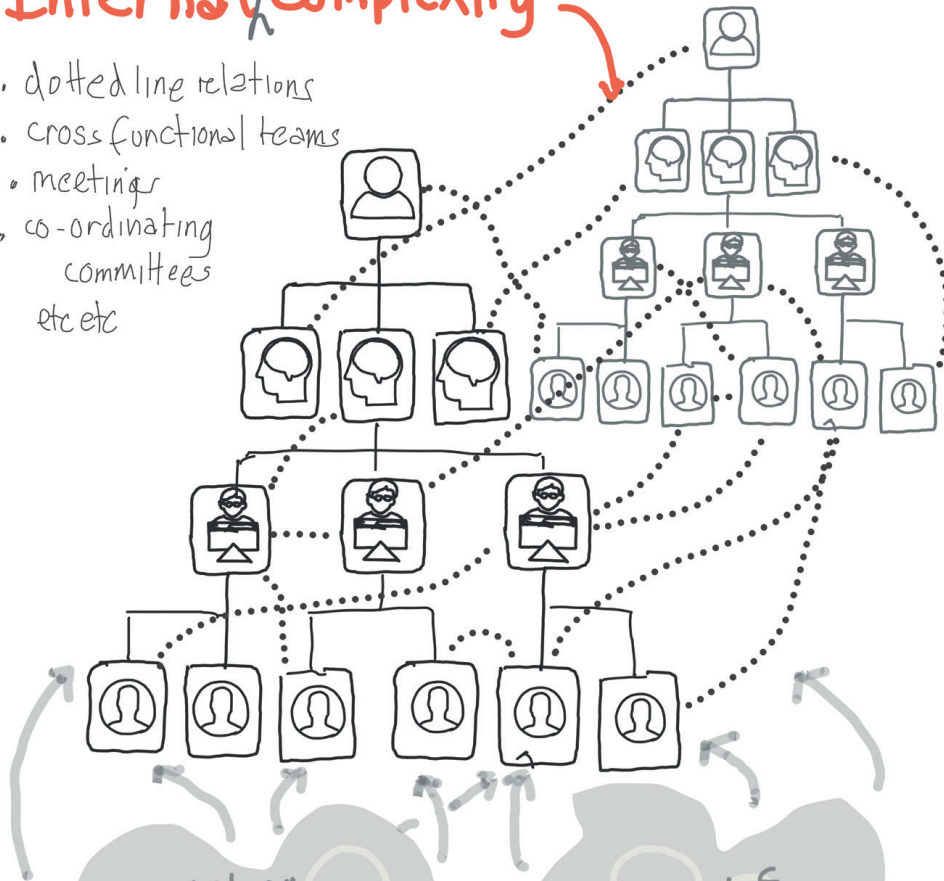
Or are we?

Complexity can originate in the external environment,
but it is also a feature of the organisation itself.

two types of The complexity problem

Organisational Internal complexity

- dotted line relations
- cross functional teams
- meetings
- co-ordinating committees etc etc



External (environmental) Complexity

How do organisations motivate people?

There are two types of people who research into organisations. There are economists, who think about things like unit costs and economies of scale. Then there are social psychologists who worry about behaviour.

Practical people are concerned with both economics and behaviour, particularly in the way that they impact motivation...the force that drives people to do things that are (hopefully) good for the organisation.

There are two basic types of motivation theories.

There are theories that argue that extrinsic rewards (i.e. administered from the outside) lead to motivation – a.k.a. carrots or sticks. Things like pay, fringe benefits, career advancement and so on fall into this category.

Economists like these sorts of theories because they easily submit to mathematical approaches and you don't have to worry about messy things like individual behaviour. So do many managers, because it makes their job easier. You don't have to understand the business, you just set targets and administer rewards (money) or punishments (sackings) and legitimise it by using the language of 'performance' and 'accountability'.

Others argue that the most important motivators are intrinsic (internal and psychological). Research suggests that intrinsic motivators take three forms:

- Mastery – the reward that comes from performing at, and extending the limit of, one's capability
- Autonomy – having the ability to choose what one does, how, when and with whom.
- Purpose – the sense that one is contributing to an endeavour in pursuit of a meaningful goal that is bigger than the self

Real life is probably messier than either type of theory assumes. Extrinsic and intrinsic motivation probably interact. This can be represented as a balance between negative and positive forces or in the form of a hierarchy whereby basic physiological needs (money, safety etc) predominate up to a point after which 'higher order' intrinsic rewards are more important.

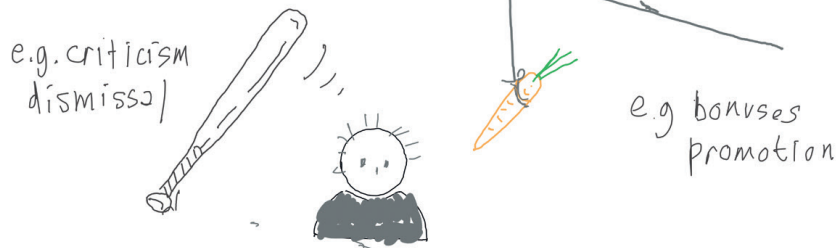
But it is probably even more complex and context dependant than this. For instance, money can be about food (extrinsic) or status and self-esteem (intrinsic) depending how much of it you (and your peers) have to start with.

One thing is for sure – traditional functional hierarchies don't promote intrinsic rewards. The scope for growth and personal freedom is limited by its rigid structure and the promise of higher purpose is often overwhelmed by the need to 'hit a number' or follow the rules.

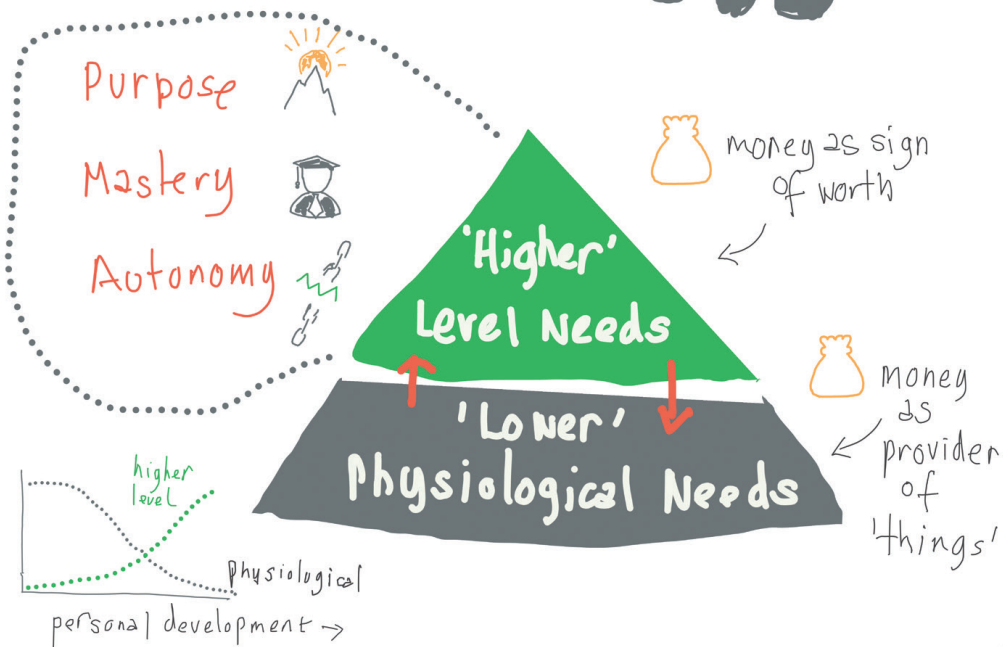
Both extrinsic and intrinsic rewards can provide motivation in different degrees and ways depending on the context. Traditional hierarchical organisations do not promote intrinsic motivation.

Two competing views of motivation

EXTRINSIC



INTRINSIC



The alternatives to the traditional hierarchical organisation

So why, when the traditional form of organisation has such obvious shortcomings, is it so dominant?

It is partly down to familiarity and a lack of imagination. But also it is because the two key assumptions that underpin it have – until recently – held up pretty well.

The first assumption is that the world is fundamentally predictable. The second is that people cannot be trusted (and shouldn't be encouraged) to take decisions on behalf of the organisation.

If this is what you believe then what you are likely to end up with is a hierarchy managed through 'command and control' where goals and plans are set centrally, and systems set up to manage compliance to them. And these beliefs are self-perpetuating because any failure can easily be attributed to the failure of individuals to which the solution is...even more of the same.

But it is increasingly difficult to ignore the fact that the world has become more dynamic, unpredictable and interdependent. The response of most organisations is to do the same things better and in more detail. Dotted lines have been added to organisation charts and software vendors have busily developed 'solutions' to help 'the centre' better orchestrate and more tightly control far flung parts of the organisation.

But when the assumptions that make top-down management (in principle) easy no longer hold, traditional organisation structures and process can be quickly overwhelmed by the challenge of managing complexity. As a result, organisations become ponderous and bloated by bureaucracy.

One alternative to such technocratic approaches can be characterised as 'cutting through the ****'. This usually involves placing greater emphasis on personal ownership of results with the charge being led by a charismatic leader who gives people licence to override the process in the interest of 'getting things done'.

Jack Welsh at GE is the poster boy for this style of heroic management. The problem comes when the supply of heroes with supernaturally good business intuitions (as the hype suggests) dries up and you need to do difficult but boring things in a competent way. As GE has found out, it is difficult to sustain a way of working that relies on 'exceptional people' who know how to make the (traditional) structures and processes work for them.

What we – you – need is another way of thinking about how organisations should be structured and run.

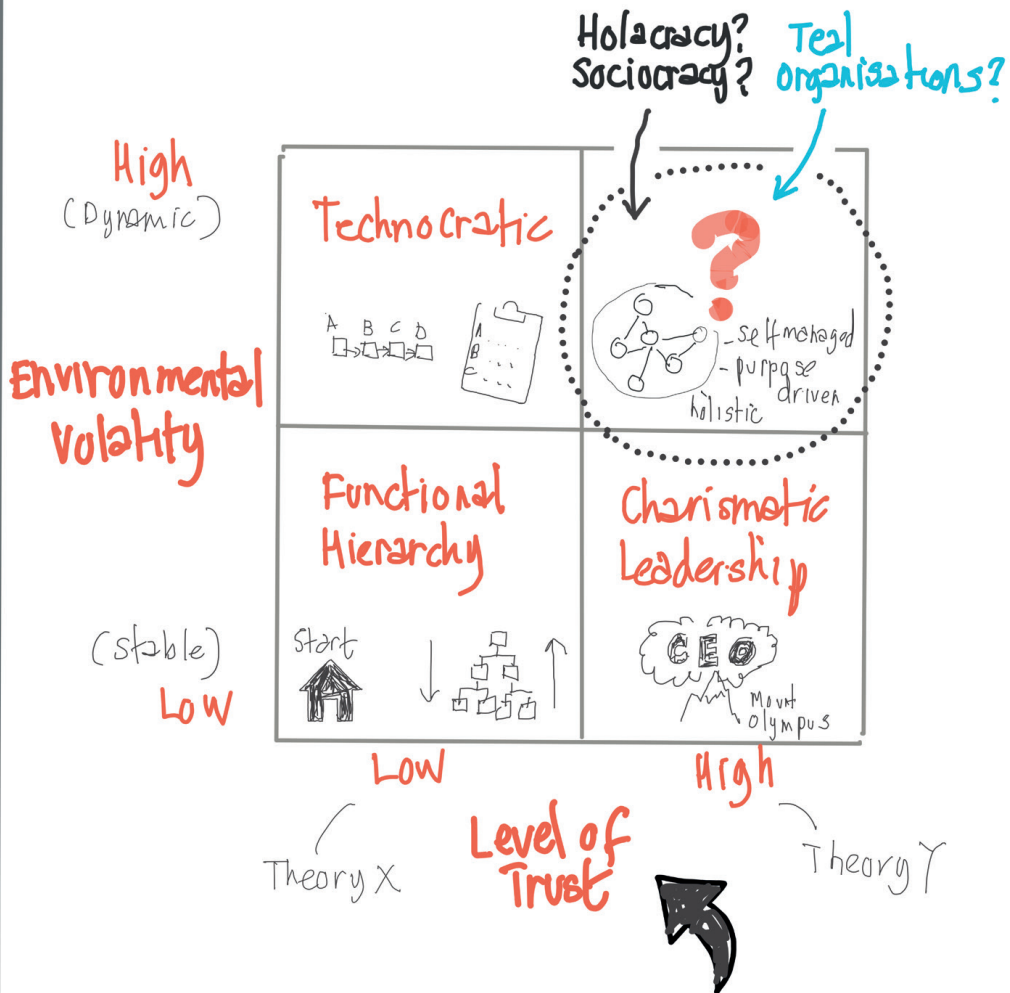
There are a number of alternatives 'on the market' at the moment, most of which assume that organisations can and should be structured like a network, operating in a more participative and holistic way.

While this is an understandable reaction to the shortcomings of traditional hierarchies, such models often do not provide solutions for the problems of scarcity faced by all organisations and the consequent need to make choices. Choices about how to allocate resources, how to adapt to the future, what activities are allowable and what are not, and most importantly, how and by whom are such decisions are made. And in the absence of a mechanism these issues are resolved (or not) informally, by politics and by power grabs.

We need an organisational model that can better deal with the dynamic messiness of the modern world and which isn't reliant on a small number of individuals who may (or may not) always know the right thing to do. One that has complexity management, the needs of people and the requirement to make (sometimes difficult) choices 'baked in'. And it should be clear, concrete and actionable, underpinned by robust logic, not – like most of the stuff you read in management books – a fashionable fad.

Traditional organisational forms and processes struggle to cope with complexity but have proved resistant to reform partly because there is no clear alternative model that fulfils the practical needs of management.

What are the alternatives?



What is **TRUST?**

"a set of **ASSUMPTIONS** about the competence, reliability and good faith of people, **VALIDATED** by experience"

What is a systems model and what does it look like?

I'm biased, I know, but I think the best place to look for a rigorously formulated alternative to the traditional organisational model is in systems theory. And I have a particular one in mind for the job. It's called the Viable Systems model (or VSM for short) but please don't rush out and buy the books just yet because they will confuse you (trust me).

Why do I think this will work?

It is because the VSM is built, bottom up, from first principles based on a fundamental understanding of how to resolve the fundamental paradox facing all organisations: how to operate within a complex environment without the organisation itself becoming so complex that it becomes unmanageable. And happily, the end product is an organisational structure and set of processes that has human beings – with their capabilities and their aspirations – be part of the solution rather than part of the problem.

Because what has gone before is so familiar, we need a different way of thinking – and of seeing and talking – about organisations to be able to progress. That is what this book aims to provide.

There are many ways to reconceptualise what an organisation is in this new systems-based model, none of which captures all the subtlety of the thinking, but we have to start somewhere. The place I have chosen to start is to characterise organisations by the five key jobs that need to be done well for it to survive and thrive.

1. Firstly, it needs to manage value exchange with the environment. Let's call this 'Operations'. Put simply, operations provide part of the environment with something it values in exchange for something that the organisation needs (usually money), thereby creating a surplus (hopefully). Operations deliver value. All other parts of the organisation provide support.
2. Secondly it needs to facilitate co-ordination of the activities of different operations.
3. Thirdly it needs to exploit the opportunities for a big organisation to do things that a smaller individual organisation cannot (easily). These benefits are called synergies.
4. Fourth, doing something new requires the organisation to equip itself to explore new environments, or find new ways to exploit current environments. In other words, it needs to adapt.
5. Finally, the organisation needs to govern itself. This involves making decisions about what it is and what it is not, what it will and won't do and how to make trade-offs when it is not possible to do everything it would like to do with the resources available.

These five jobs are the responsibility of five subsystems – Operations (value exchange), Co-ordination, Synergies, Adaptation and Governance, which sit within a nested hierarchy. Although the model has a hierarchy and the jobs that are performed are familiar, the way that it works is very different from what you will be used to.

First the hierarchy does not represent organisational power, because authority is distributed around the system depending on the nature of the decision that needs to be made and the different perspective that each part has of the world and the organisation itself. And, unlike a normal organogram, what individuals do is not necessarily tied to one role or a single level in the hierarchy.

Also, the relationship between the different levels is not one of subordination or importance. Instead, a balance needs to be struck between every component of the system.

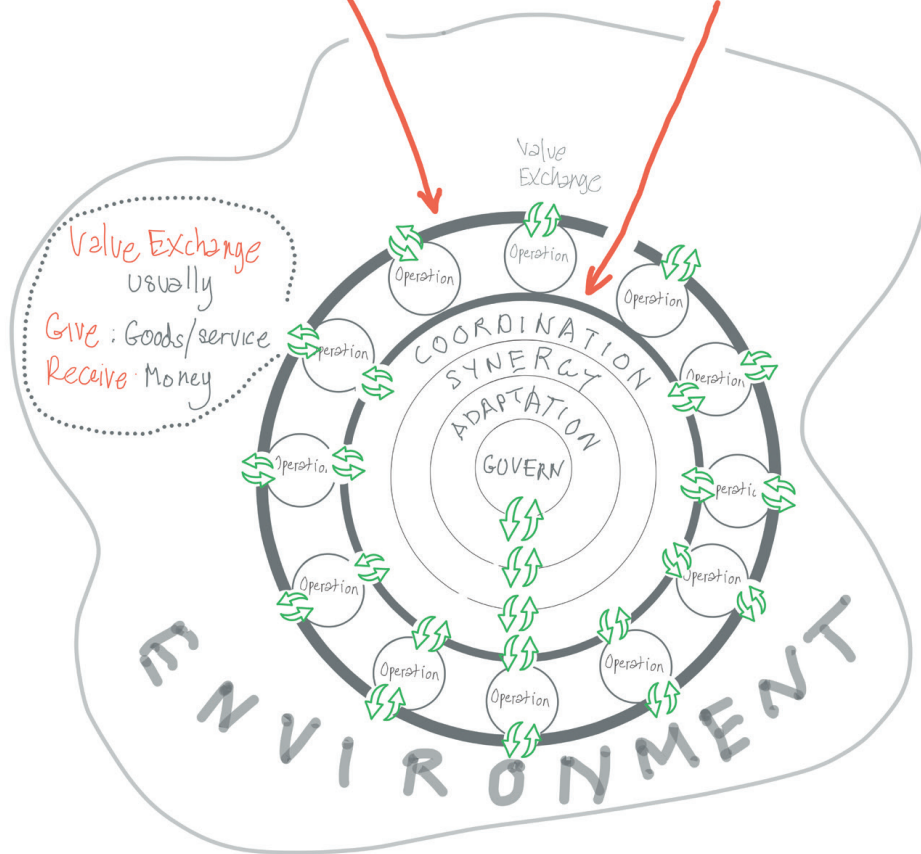
How these 'essential balances' are struck determine the character of the organisation and provide its ability to survive and thrive. Which means that 'performance' is not collapsed down to a small number of variables and the ability to hit an arbitrary number at one moment in history. Instead maintaining a dynamic balance provides the organisational pose necessary for it to achieve its purpose in a challenging and unpredictable world.

A viable organisational system comprises five subsystems with distinct roles that need to be held in a dynamic balance at all times.

A systems based alternative

Operational Subsystem

Managerial Subsystem(s)



 = Essential Balances = 



with thanks and apologies to my great friend Ivo Velitchkov who coined the term (read his book as well!)

What is a 'systems approach'?

In this book we are using a systems perspective to help understand and describe organisations. This begs the question – what, in this context, do I mean by 'systems'? You will learn as you read, but let me summarise what it means (for me at least) as it will help you understand where I am coming from.

The world is made up of things, and these things have relationships with other things. The things may be physical, or they can be conceptual, like words, concepts or theories, and big things tend to be made up of collections of smaller things. The relationships between things may be very strong, direct and immediate – if I press a key on my computer it will reliably have a certain effect. Or it may be weaker, indirect and delayed – what I teach my children now will affect the kind of adult they become in the distant future.

Conventionally we tend to focus on 'things' and place them in categories, linked by simple one way cause and effect. Systems people, however, tend to focus more on the relationships between things, and especially how a change in one thing affects other things to generate a pattern of behaviour in a group (system) of things. But there is an obvious problem with this approach. Nothing is completely isolated...everything is linked to everything else, so how does a systems approach help? To avoid trying to 'boil the ocean', adopting a systems perspective requires us to define a system boundary and a level of enquiry. This is determined by the purpose of that enquiry.

So, for example, medical people have many different ways of subdividing the operations of the human body depending on what kinds of disease they are interested in. These can range from the detailed biochemical processes that pharmacologists study to the mechanics of bones, joints and muscles that are the territory of musculoskeletal surgeons at a macro level. And some of what doctors describe as systems are not – to the uneducated eye at least – obvious, like the endocrine or the immune systems.

Systems people, like good doctors, always recognise that whatever distinctions they make for a specific purpose are not 'the truth', they are simply a useful or convenient way of looking a problem. Ultimately what counts is the behaviour (or health) of the whole system, however that is defined. And if an intervention they make to achieve a particular result leads to what is sometimes dismissively called a 'side effect' this is often a sign of an important relationship having been excluded from the definition of 'the system'. So, 'Systems Thinking' gives us a different perspective on the world and helps us ask better questions.

The second way in which it helps is the relationships between things are what determine how systems behave, which is what we need to know if we are interested in making them work better. This is powerful because there are a limited number of ways in which things can be related to each other, so knowledge can be transferred from one domain to another and understood using the same set of conceptual tools. For example, a vicious circle describes a set of relationships where a deterioration in one thing leads to a deterioration in another – an idea that can be applied to arms races, personal relationships and climate change. And our bodies and the computer that I am using right now work because their behaviour is tightly controlled using feedback loops. I think of these generic concepts as belonging to 'Systems Science'.

In this book you will be introduced to many such conceptual tools, the most important of which is the concept of an organisation – a system with a boundary with internal arrangements that enables it to preserve its own organisation. In other words, an ability to maintain its own separate identity.

The question that this book is seeking to answer, using a range of system concepts, is what arrangements are needed to make an organisation good at doing this, particularly when it is not possible to predict what capabilities it will need in the future? And how can we use this knowledge to help build better, healthier, organisations?

Systems Thinking helps us ask better questions. Systems Science helps provide better solutions.

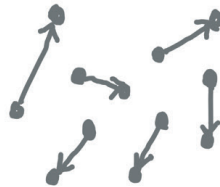
Systems approaches ... and how they help

Systems thinking

... how things relate



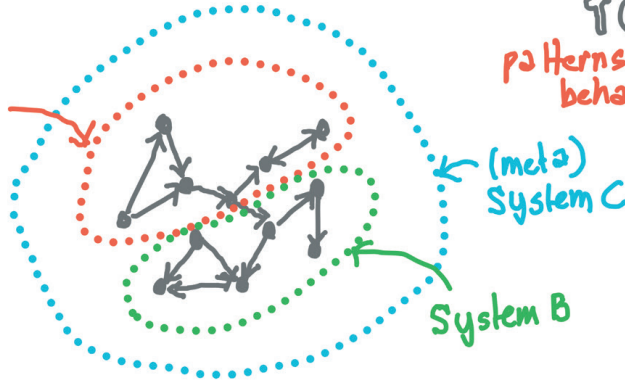
System A



isolated FROM cause & effect



TO patterns of behaviour



Organisation



Regulatory system

Goal



System Science

... how relationships work

