Do you face the challenge of wicked problems where the solution and its implementation are not clear?

Sometimes when problems arise everyone pretty much agrees what has to be done and the right way to go about it, so-called tame problems. Tame does not mean simple – reaching a solution may be extremely difficult and complicated – but tame problems can usually be defined, analysed and resolved in a sequential manner.

In other situations, even when there is an agreed goal – reducing crime for example – stakeholders have quite different perspectives on the nature of the problem, what may be causing it and how to resolve it. A challenge of this sort is called a wicked or complex problem. It can not be divided into manageable chunks because the interactions between each of the parts produce unexpected consequences. Tackling it effectively requires a whole other way of thinking.

At CIHM we believe that groups of people can have the wisdom and the capacity to find their own solutions.

If they haven’t done so, it’s probably because they do not have either a truly shared purpose or there are some voices that are not being heard or they do not have a mechanism for exploring possibilities together.

These are the things CIHM can help with. And when these people want to look for ideas, evidence and practice from elsewhere, we have the whole resource of the university to help.

At CIHM we work with an underpinning theory of how and why particular actions and methods bring about change – a model of change – which draws on a theory of organizations as complex adaptive systems, or evolving systems. We design practical ways of intervening to influence the way complex systems behave.

In this series of Whole Systems Working Papers we explore this way of thinking and the actions it can lead to.
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Diane Plamping Pat Gordon Julian Pratt
CIHM Associates, 2009

The Centre for Innovation in Health Management (CIHM)

The Centre for Innovation in Health Management, at the University of Leeds, is a network of doctors, public sector managers, organisational change consultants and academics, who are passionate about improving public services. We believe that CIHM is unique in that it is a ‘think and do tank’: not only do we undertake major pieces of academic research but we also work with public sector organisations to help create the conditions in which change occurs. We work with partners nationally and globally to generate new knowledge and apply it in the quest to deliver more efficient and effective public services.
Preface

This essay is aimed at public service leaders at all levels – political, managerial and professional – who are required to manage both for the common good and for quality services to individuals. For more than a decade the Government has put improving performance at the centre of its policies for modernising public services. Innovation is the current imperative and we hope this account helps busy managers who are grappling with the question ‘How can we grow a culture that supports innovation?’

The essay is about the organisational and system factors that impede or facilitate innovation. We offer a way of thinking about innovation as evolution. This way of thinking helps to clarify the very different challenges facing those trying to stimulate innovation in the public and private sectors.

Innovation is linked to ideas of survival in a global economy and renewal in public services, but in the vast literature on the subject relatively little attention is given to the ‘system as innovator’ as opposed to the ‘individual as innovator’. This is our focus.

Innovation as evolution requires three key elements which constantly interact:

Generate new possibilities. It is widely assumed that people working in public service organisations need stimulation to come up with new ideas. We suggest that when managers listen to the ideas that people have, they discover a wealth of new possibilities.

Amplify positive adaptations. Market mechanisms are able to provide innovations with an income stream, but no such automatic amplification is available in public services. The commonly held model of change about the spread of innovation in public services is a push model of amplification, in which effort goes into disseminating the results of demonstration projects and best practice. Instead, we propose a pull model with a focus on internal strivers, rather than external drivers. We suggest that the take-up of new ideas and practices is highly dependent on the readiness of the adopters, and that support for innovation should be focused on nurturing this readiness.

Eliminate adaptations that are no longer useful enough. Market forces provide effective ways of eliminating products or businesses that fail to generate a profit. This is a normal and healthy aspect of market behaviour. Public services require alternative mechanisms. If we only evaluate what’s new it is likely to be very hard to disinvest. Public services need a mechanism by which all services, established as well as innovations, are evaluated as a portfolio of investments, and the least valued are eliminated.
1. Context

Innovation is part of the zeitgeist. It can take many forms – an object (like satnav), a process (like hole-in-the-wall banking), an idea that gains currency (like feminism), a new use of language (like carbon footprint), a service (like a personal shopper), a technology (like credit derivatives). It is linked to ideas of survival in a global economy and to beliefs that old, established systems build up inertia and need special measures to bring them into the 21st century.

The UK government, committed to modernising public services, commends innovation as a source of renewal and improvement. Public sector managers are required to seek and encourage innovation as a means of improving services. In 2009, Strategic Health Authorities have been given a duty to promote innovation and the Department of Health has issued guidance1.

‘This is the third programme this year on innovation. Everyone knows it is important but no one knows how to make it happen’2. said the broadcaster Peter Day on the BBC programme Business Today in May 2009. Recent research from McKinsey finds that while innovation has become ‘a core driver of growth, performance, and valuation’, most executives surveyed were ‘generally disappointed in their ability to stimulate innovation’3. Williams et al from the University of Birmingham echo the McKinsey study in finding that ‘the existence of innovation implies progress and improvement. As such, its importance to health care design and delivery has long been assumed. By contrast, actual achievement of innovation is far more complicated and contested’4.

In the face of high levels of government debt, a global recession and falling public expenditure, the future of public services would be bleak indeed without the prospect of innovation in the way these services are delivered. These could be innovations in efficiency, effectiveness or personalisation.

The Birmingham review makes clear that while the literature on innovation is vast it suffers from a number of gaps and weaknesses4. These include:

- the relatively recent attention paid to the organisational and system factors that impede or facilitate innovation
- the least well understood stages of the innovation pathway which are sustaining and de-commissioning (as opposed to adopting and diffusing)
- the very few studies which explore underpinning theories of change.

We hope this paper contributes to filling these gaps. To begin, we distinguish between innovation and invention.
## 2. Distinguishing between innovation and invention

Without venturing into the quicksand of definition, a useful distinction can be made between invention, which is about generating or creating a new idea, and innovation, which is about introducing something new into the world.

The generation of a new idea occurs in the mind(s) of the inventor(s). To be described as an invention it has to be completely new. It doesn’t have to be embodied or communicated with anybody else, or make a difference to the world. An invention may be the first step in a process of innovation.

Innovation is not the same as novelty. Innovation may require an invention, but usually does not. It is more likely to be an idea whose time has come; a new combination of existing ideas and production processes. One of the most fruitful sources of innovative ideas is copying from elsewhere.

Innovation is a process of putting something new into practice. If it is new in that context then it is new, even although it may have been around elsewhere for some time. What is special in service industries, and thus public service organisations, is that innovation requires human behaviour change. Successful innovations take root and flourish; the changes in behaviour stick and make a lasting difference. Those who strive to create lasting change in ‘the way we do things around here’ need social relationships. Innovation is not a solitary activity but one that takes place over time through the interaction of many people.

### Distinguishing between invention and innovation

Drug companies have big R&D investments. Currently there is dissatisfaction with their rate of innovation. One company believes this is due in part to a faulty regime of performance measurement.

At present the whole department is held responsible and rewarded on the basis of bringing drugs to market. But the purpose of the ‘bench scientists’ is to engage in invention and the purpose of the market developers is to engage in dissemination (or amplification).

They propose that the rate of innovation will increase if the scientists are measured on their ability to explore and generate new products, unfettered by considerations of market success, and the market developers are measured on their ability to put something new into practice i.e. bring new products to the market.

The stories that we tell about innovation often focus on invention. We honour inventors and name things after them. We celebrate firsts, discovery, rather than spreadability.

Every schoolboy knows that Alexander Fleming discovered penicillin. Very few know that Howard Florey and Ernst Chain were the scientists who recognised its potential and fought to develop it for clinical use.

In 1945 the Nobel Prize was awarded to Fleming, Florey and Chain.
Eureka moments at best describe the last piece falling into place, not the multiple frustrations and persistence which characterise real life innovation. We know the past is rich in ideas that did not thrive in particular environments, but the storyline we seem to prefer is the step – by – step ladder of progress rather than a branching evolutionary tree with lots of blind alleys.

The way we write history turns every step into progress. The alternative, and it is hard, is to tell how we do our best.

WILLIAM MORRIS

Invention and innovation are interwoven processes and understanding their distinctiveness may help us to see where and how to act when we want to promote them.
3. A theory of innovation as evolution

Without an underpinning theory of change – why and how particular actions and methods bring about change – it is hard to grapple with how to act to stimulate innovation. This section makes explicit our theories of change. In doing so we draw on the theory of evolutionary systems, the mechanism which has sustained life for over 2000 million years.

It has become fashionable in recent years, particularly as a result of the growth of organisational outsourcing and networking, to describe organisations as operating in, and being part of, ecosystems. The use of this biological metaphor brings with it implications of mutual dependence, competition for resources, dynamic stability and vulnerability. It is in the context of ecosystems that organisms evolve.

Eric Beinhocker suggests that businesses are subject to evolutionary pressures and evolve in the marketplace; and business plans describing particular products or services evolve within each business unit. He suggests that evolution is not just a metaphor for understanding innovation but that innovation is a member of the general class of evolutionary systems that also includes the evolution of life. This is a view which we accept.

A system is something that can be seen both as a whole and as interconnected parts. Evolutionary systems are not passive. They require active interplay between three distinct elements:

- A means of generating new possibilities
- A means of amplifying valuable adaptations
- A means of selecting out adaptations that are no longer useful enough.

In an ecosystem, each organism (agent) finds itself in a context (environment) which has the effect of amplifying success and selecting out failure. The organism has the capacity to evolve if it can generate new possibilities for itself.

Moths: an example of interplay between agent and environment

The ‘peppered’ moths living near English industrial cities vary in colouration from light to dark. During the 19th century, sooty smoke from coal burning furnaces killed the lichen on trees and darkened the bark. Over generations, the environment favoured darker moths which became progressively more common. By 1895, 98% of the moths in the vicinity of English cities like Manchester were mostly black.

Since the 1950s, controls on air pollution have meant that once-blackened buildings have been cleaned, the bark of trees is no longer darkened, lichen has grown back and the pattern of moth wing colour has lightened. Many researchers have documented this and demonstrated the evolution in peppered moth colouration linked to camouflage advantages.
In human systems, an organisation (agent) operating in the context (environment) of a market knows that the market has the effect of amplifying and eliminating through what we call market mechanisms (consumers choose what to buy and investors choose what to invest in). If the firm can generate variety in the shape of new products or services, it has the capacity to evolve. For example, the millions of women who buy underwear in Marks & Spencer today would recognise the shadow of their mothers 50 years ago, and perhaps even their grandmothers.

Just like a commercial firm, a public service organisation (agent) has to give attention to generating new possibilities but the public service context (environment) is not a market. Since the interaction between agent and environment is crucial we need to understand the nature of the public service context, and the mechanisms for amplifying and eliminating which are not the same as market mechanisms.

The simplest evolutionary systems are computer tournaments in which a population of agents interact with each other over thousands of generations. Each agent comprises computer code that describes that agent’s decision rules. As the agents interact in the environment of the tournament, some rules are more successful than others. At the end of each step, some rules mutate and some recombine while less successful rules die out. The relative success of an agent, compared with other agents, in that environment determines whether its code will be passed on, in some form, to subsequent generations.

Evolution is dynamic and not the same as intelligent design, where outcome is not uncertain. The exact nature and timing of the new entities/agents and the patterns of behaviour that emerge cannot be predicted. Evolution takes place by means of a dance or a ‘drunken walk’ which may at times turn out to be a ‘great leap’. There is no search for ‘best’, but a series of usually small changes and improvements which constitute ‘better’ in the local environment. Progress is not inevitable and there are many blind alleys. For much of the time change takes place in small incremental steps, but at times this pattern is punctuated by large and rapid step-changes.
The speed of biological evolution depends on the length of time between generations – bacterial resistance to antibiotics evolves over a much shorter time-scale than moth camouflage.

As humans, we evolve socially as well as biologically and the evolution of ideas happens as fast as people are capable of generating and adopting new ideas – or, more probably, as fast as we are capable of letting go of established ideas.

Memes, acting in ways similar to genes in biological processes, have been proposed as a way of understanding a mechanism for generating the adaptation we recognise in social and cognitive processes. Conscious beings can generate entirely new thoughts and these can be amplified or eliminated from patterns of social thinking which in turn has an impact on social behaviour.

We hypothesise that innovation in evolutionary systems requires constant interaction between three elements which we address in the next section.

- A means of generating new possibilities
- A means of amplifying useful adaptations
- A means of eliminating adaptations that are no longer useful enough.

We suggest that the challenge of amplifying and eliminating is quite different in the market and the public service contexts.
4.1 Generate

In order to evolve, living systems require mechanisms to generate variety.

Order, in living systems, is not designed in as a blueprint but arises from the repeated application of guiding principles. Self-organisation leads to structures that are diverse but share the same underlying pattern of organisation. The details of each tree, for example, differ from others. They are not rigidly prescribed but arise from self-organising principles. Trees maintain some sort of ‘treeness’ in a variety of different circumstances. The pattern and overall shape of each tree are exactly as one would expect them to be but there is no way of predicting that a particular location in space will be leaf, branch or air.

The mechanisms by which life has evolved include two other ways of generating variety in addition to self-organisation. These are mutation (random changes that produce large or small consequences) and recombination (the mixing of the genetic material of two parents to create a new organism).

In human systems, an equivalent of a mutation is a change made by a single person. This might have small or large impacts. In modern service organisations, much of the thrust of policy is to suppress variation in individual performance by using protocols and performance management. This is understandable where the performance is unacceptable – after all most mutations are lethal to the organism – but there are unexpected consequences. Suppressing variation inhibits innovation.

An equivalent of recombination in human systems is the practice of dialogue, a conversation that leads the participants to question their own assumptions and develop new ideas and perspectives. Dialogue engages with meaning and purpose and may result in new ways of seeing things and new flows of information. (This contrasts with debate in which existing points of view are aired and some people are convinced to change their position). Dialogue requires time and space, conversational processes, and an uncommon mix of participants.

But we are not limited, in human systems, to the equivalents of self-organisation, mutation and recombination. We can consciously choose to generate new ideas and new ways of doing things. The energy to do so usually comes from dissatisfaction with the status quo. One part of a creative designer’s profile is optimism that there are possible solutions – the paradoxical stance of being a dissatisfied optimist.
How production processes shape possibilities

The energy for finding new ways of doing things usually comes from a sense of possibility, a realisation that things could be better. This may be as insignificant as dissatisfaction with getting sauce out of a bottle or as significant as the friction encountered when dragging a load along the ground.

In craft industries, there is no separation between creation and production. The energy for invention seems to come from an impulse to do the job well and produce better objects. For craft workers, invention is a process of continuous experimentation to achieve new products; and it merges into innovation as the successful inventions are incorporated into the norms of craft practice.

In manufacturing industries, there is usually a separation of inventors and designers from manufacturing workers. When this is the case, they use a variety of means to acquaint themselves with dissatisfactions and with possibilities. These include direct observation of the manufacturing, distribution and use of the product; interviews and questionnaires with the makers and users; analysis of complaints and queries; comparison with competitors; sales data and so on. Often they work in teams, sharing the information and bouncing ideas off each other.

In service industries, the challenge of generating new ideas or practices may be rather different. Some standardised services like package holidays, say, or car washing are ‘done to’ the customer in what is in effect a production process. The whole process is visible to supervisors who are in a position to invent new ways of providing the service. At the other end of the spectrum, and equivalent in some ways to craft work, are services that are personalised (such as an architect-designed extension to your house) and may be personal as well (such as hairdressing).

In public service organisations, the key production process is delivering services. Some are delivered on a one-off basis and are impersonal (the courts, fire service). Others deliver personal care services where the ‘product’ is co-produced by a skilled and often autonomous professional working with a client, customer or patient who brings their own experience and understanding of the possible outcomes. The desired outcome is not one-size-fits-all but appropriate variety. Such services are difficult to standardise because, in each interaction, the professional and client re-make the service together to produce an outcome that is appropriate to that particular situation. Co-production, as it is known, has started to generate a lot of interest as more people recognise service users as a source of possibilities and new ways of doing things.
So what does this mean in public services?

In order to evolve, living systems require mechanisms to generate variety. It is widely assumed that the people working in public service organisations need stimulation to come up with new ideas. We suggest that when managers listen, they discover a wealth of new possibilities.

Generating new possibilities comes from allowing people to experiment. In many trades and professions there is evidence of an inherent desire to experiment and adapt9. In service industries, particularly where front-line workers are autonomous and highly-skilled professionals, the search for new possibilities is always likely to be driven by these workers as they respond to the people for whom they provide services. (Purpose is crucial here. The desire to experiment has to be about improving quality or efficiency – not boredom or self-interest or professional whim).

One approach to improving quality has been to standardise care. There are compelling reasons for wanting to eradicate poor practice but one of the unintended consequences of standardising services has been to reduce variation and thus the capacity for innovation. One way around this is to apply standards for poor practice ‘below the line’ and allow variation ‘above the line’ e.g. so-called earned autonomy.

The key process for generating new ways of doing things is time and space for dialogue amongst unusually mixed groups of people. This is the same in all production processes. Social, organisational and inter-organisational innovation requires groups of people to develop creative solutions together. To succeed these groups need energy for change; diversity in their membership; time and space for dialogue; and processes for thinking together.

Energy for change – harnessing dissatisfaction

A great source of energy for change in public services is the dissatisfaction felt by public servants for the way in which they are expected to work which they know is different from what they aspire to. The problem with tapping into this energy is that many have a history of seeing their concerns, ideas and suggestions dismissed by the organisations for which they work. This leads in some cases to a position of ‘learned helplessness’ in which professionals fail to challenge practices that are unacceptable, let alone less than optimal.

Managers have the opportunity to harness this dissatisfaction. This may require no more than meetings at which teams discuss their dissatisfactions and explore what they can do about them. (This is not about producing wish-lists and may require ground-rules such as ‘no complaints without recommendations’ or ‘no additional funding required’.) One of the most underused resources may be staff-in-training and students who come into situations for a fairly short length of time and find that rather than contribute their fresh insights, they are expected to fit in to the ‘way things are done around here’.

If a team is unaware of dissatisfaction, there are ways of increasing it including feedback of performance measures and financial information, introducing specific challenges, comparisons with other units and so on. But most effective of all is to harness the other great source of dissatisfaction, that of patients and others who receive services. This may be done at one remove using records of their experience on blogs and websites, but if patients are to contribute to the solutions as well as to identifying the problems they need to be included as partners in the dialogue.
The bonus of mixes

When a group of people has an explicit, shared, organisational purpose – reducing waiting times in a hospital’s emergency department, for example – then an unusually mixed membership is a bonus. People come across others who bring different connections which result in different flows of information and can lead to new resourcefulness. The bonus of mixes is akin to the recombination in living systems that results in new organisms.

We use the term mixes to mean mixed in different ways – different levels within an organisation, and across organisations; people from different functions like regulatory, operational, clients, policy; not just the usual suspects but people who know how to make things happen as well as those with formal power; people who reasonably expect to have continuing relationships and repeated interactions in the future. This so-called ‘shadow of the future’ is essential for sustainable change in a system’s behaviour.

If an organisation’s capacity for innovation lies mainly in the interactions between service provider and service user, then giving attention to what is being learnt on the frontline is an important act of leadership. Peer review, reflective practice and supervision are traditional methods for practitioners to introduce new approaches, as well as to manage quality control. A drawback is that, unless sufficient diverse voices are included, they may also reinforce the dominant way of seeing things in a profession.

Example: the bonus of mixes

An NHS Trust has used a process called ‘Intelligent Recruitment’ which is designed to get different sorts of people into post. The innovation is to move beyond CVs into a second stage of recruitment which gets people working together on real problems. The assessors are a mixed group, including patients, whose field of expertise is not the same as the candidates. ‘We appointed someone who would not have been appointed under the normal interviewing process – very much younger – and he has been a star.’

This is just one way this organisation is working ‘to jostle up assumptions’.
Time and space

There are lots of techniques to stimulate creative thinking and these may be used by individuals or by groups. The necessary environment for generating ideas and new ways of doing things includes space for both intensive study and for ‘down time’, the time spent hanging out the washing or walking the dog that may be so productive for individuals.

When people come together as a group they require some structure to their time thinking together. In addition to the techniques individuals may use, there are many inquiry methods that provide a structured way for people to get together to ‘wonder why’.

It is pretty certain that a group of people meeting around a committee room table with a full agenda is unlikely to have the time or energy for creative thinking. Their purpose is different – to get through the business of the meeting, make the necessary decisions and provide an audit trail. Agenda-less meetings may be the organisational equivalent of down time, and dialogue is an appropriate way to give structure to such meetings.

Dialogue

Dialogue is a process that challenges participants to explore the assumptions that underlie their own thoughts and speech. By contrast with debate or even discussion, dialogue provides a way for participants to go beyond rehearsing their existing position to finding an understanding that they share with other participants. It enables people to think about the way they see the world, to challenge their own theories of change.

Team learning reviews

In both private and public sectors, organisations that encourage action learning find that teams with clear purpose, where individuals’ contributions are known and valued and who meet regularly for feedback and review of service delivery, perform more highly than those who do not. High-performing health care teams are more satisfied and deliver better results for patients, in terms both of patient satisfaction and clinical outcomes.

Example of an organisation that uses team learning reviews.

One of the functions of the National Clinical Assessment Service (NCAS) is to make assessments of doctors and dentists who are a cause for concern. Each assessment involves a team of assessors. After each assessment report has been completed, the NCAS team meet to discuss what went well and what went badly, and to identify how the organisation’s way of working could be improved. Because the meeting includes people who can make changes to the standard way of working, improvements can be rapidly introduced.

Most are relatively small though important, but there have been some major organisational developments that can be traced back to these meetings. The need to provide specialist support to practitioners with health problems is an example.
Regular reviews of practice for learning can provide a way to identify not just dissatisfactions but pride in areas where the team has provided a good service; as well as a forum for finding improvements and better ways of doing things. They provide a practical way of completing some of the feedback loops that a system requires if it is to learn and adapt.

**After Action Reviews**

After Action Reviews (AAR) were conceived in 1981 to help US army leaders adapt quickly to dynamic, unpredictable situations. AAR meetings (always plural) are designed to create full and honest participation across all ranks to improve performance not to apportion blame. They have been used by corporate and non-profit businesses to understand what they do wrong but few learn from the process in a meaningful way as they fail to understand the underlying design principles.

‘These failures stem from three common misconceptions about the nature of an AAR: that it is a meeting, that it is a report: that it is a post-mortem. In fact AAR should be more verb than noun – a living pervasive process that explicitly connects past experience with the future action.’

Virtually all AAR meetings begin with a reiteration of the house rules... ‘No thin skins. Leave your stripes at the door. Take notes. Focus on the issues, not those above us’

15
4.2 Amplify

In order to evolve, living systems require mechanisms to amplify valuable adaptations.

In both computer tournaments and living evolutionary systems, code that is successful relative to other code is passed on to more members of the next generation than code that is less successful. This is a mechanism for amplifying successful code.

We believe that in human systems culture is embodied in the guiding principles or rules of thumb that people use all the time. These rules of thumb are a form of cultural code. They determine ‘the way we do things around here’.

Markets as evolving systems

If you find yourself operating in a market and you produce a new service or product, you can attract a new stream of revenue as demand increases and customers choose to buy it. Anticipation of this increase in revenue encourages investors to invest, as it funds not only production but also profits. These choices, by consumers and investors, provide a powerful way to amplify good business ideas.

All companies struggle to decide which are the good ideas and which have little potential. The decision criteria cannot provide certainty of profit, just the prospect of profitability based on estimates, hunches and the recognition of patterns. Once a good idea has been selected, private sector firms need robust internal mechanisms to provide backing for rapid prototyping and development into production. They also need mechanisms to amplify the sales by stimulating new demand for the product through advertising, which in turn increases the power of profit as an amplifier.

Market mechanisms are able to provide innovations with an income stream, but no such automatic amplification is available in public services.

So what does this mean in public services?

Public services are always shaped by the social and political context in which they are delivered. We find it helpful to use the term public services to describe any service whose purpose is to serve the common good, the good of the public as a whole. The nature of the common good is always contested and must be decided by political processes. This means taking account of the different perspectives of many groups of people. In order to serve the common good it is necessary that public service organisations work together - safety and security cannot be ‘delivered’ by the police acting alone, for example.

We use public service organisations to commission and regulate services on our behalf as well as to provide them. The agency role is to shape demand and supply and, at the same time, to ensure and develop quality. The funding of public services is a political process and if an innovation improves the quality of a service, but at an increased cost, a public service organisation that wants to amplify it can usually do so only by cutting investment elsewhere.

There are of course innovations whose purpose is to improve efficiency, and they may become self-financing. Sometimes an innovation allows a service to be provided at lower cost and thus generates its own savings; the only investment needed will be pump-priming or invest-to-save money (though this may not be readily available in a public service).
This cost reduction does not generally lead to an increase in demand for the service. This may partly be because it is a universally available service and so there should be no unmet demand; and partly because where there is unmet demand and throughput is increased, this may not be backed by the ability to pay under the terms of the contract.

No increase in market share
The innovation of successful medical treatment for people with a duodenal ulcer led to a dramatic fall in the need for surgical treatment. The result was cheaper and better care but this cost reduction did not and could not stimulate demand; nor was there an automatic mechanism for redirecting the budget for duodenal ulcers from surgery to medicine.

So what are the ways of amplifying valuable adaptations in the public service context?

Local conditions matter: seek out good ideas elsewhere, and adapt them
The commonly held model of change about the spread of innovation in public services is a push model of amplification, in which effort goes into disseminating the results of demonstration projects and best practice. Instead, we propose a pull model with a focus on internal strivers, rather than external drivers. We suggest that the take-up of new ideas and practices is highly dependent on the readiness of the adopters, and that support for innovation should be focused on nurturing this readiness.

The push model is based on a tenaciously held belief that ‘the pilot project leads the way, the learning is distilled and the best practice rolled out’\textsuperscript{16}. Often it is undertaken with support from an external body like a development agency or strategic health authority which creates ‘drivers for change’.

Albury and Mulgan identify a problem in the public sector of focusing on best practice and top achievers and failing to give enough attention to strivers who they suggest are the greatest source of innovation\textsuperscript{17}.

We believe that despite good intentions, the push model of amplification seldom works and results in much frustration when it fails to alter the mainstream. Being rolled-over may provide a fix for a current problem but is unlikely to develop the capacity to change locally. The failure is then attributed to resistance to innovation and a rejection of developments that are ‘not made here’.

We believe, by contrast, that failure occurs because little effort is made to roll out key elements of the context of a best practice example, namely, the time given to developing relationships and exploring possibilities, which are followed later by the specific innovation. In living systems, local environment and local history are always important.

There are times when compelling ideas spread ‘like a virus’, but even then there are differences in spread that reflect local conditions. Paul Cairney has documented this for policy transfer using the smoking bans introduced by the four countries of the UK, where international trends were influenced by local political receptivity and the availability of ‘windows of opportunity’\textsuperscript{18}. This resulted in different implementation in the different countries.

A pull model of amplification is one in which organisations set out to build their own capacity for innovation. They do this by thoroughly knowing their local conditions, their local history, their energy for change and by seeking out new ideas in the full knowledge that good practice will always have to be modified and customised to fit. Examples of good practice are of great value when you know you are ready for them. (It is not necessary to re-invent the wheel, but the wheel will not be adopted where nobody feels the need for one.)
The skill lies in being clear about what is transferable, and recognising that change is unlikely to stick without adaptation to fit local conditions.

In a pull model of amplification, organisations and external development agencies create, legitimise and support opportunities for people to extend their horizons, pick up ideas, become exposed to different ways of thinking and ‘steal ideas with pride’; and they anticipate and welcome adaptations to fit the local context. Whether this search is successful depends in part on how easy it is to find ideas that have already been shown to work in another context. This is the stage at which best practice examples come into their own.

Sometimes skills become valued that have not been necessary before, ethnography for example. Anthropologists who work in health promotion teams are able to contribute what they term ‘thick’ contextual descriptions to help tailor programmes to the needs of specific groups e.g. smoking cessation among Sylheti men in East London whose pattern of tobacco use is distinctive.

Sometimes new roles become important - someone who is skilled in accessing examples of practice, someone to attend the meetings that are held to tackle specific dissatisfactions, someone who can identify examples elsewhere that help with the question ‘how could we do this better?’ This could be a specialised job, or a post into which all members of a team rotate for a time. We have used the term ‘boundroid’ to describe people in this kind of role19 and Williams et al describe the importance of ‘technology brokers’ who bridge worlds and build networks, because in the beginning innovation is always deviant 4.

Stop stopping it

If we believe that frontline workers are naturally innovative then the vital requirement of an organisation’s culture is not to stop them. A recent survey of senior executives found that ‘paying lip-service to innovation but doing nothing about it was the most common way they inhibit it3.

In all sectors, some large organisations have recognised that start-up companies seem to be better at inventing and innovating than they are. This may be because the culture of established companies is more risk-averse and bureaucratic. New ways of doing things may be suppressed because they threaten the status quo. Large organisations, in as much as they have survived, have found a successful strategy and so they are biased towards the status quo – the competence trap.

To counter this, there has been a vogue for setting up ‘skunk works’, free from everyday operating procedures and cultural norms. These provide a focus for inventions, but much more important may be their role in incubating and protecting the developing innovation from being suppressed by the dominant culture. This needs the encouragement and protection of senior people.
Rapid prototyping example: Nursing Shift Changes

The problem: nurses at Kaiser Permanente spent the first 45 minutes of each shift at the nurses station being debriefed by the departing shift about the status of patients. Methods of information exchange varied – scribbled notes, recorded dictation, conversations – and nurses often failed to learn some of the things that matter most to patients such as whether or not certain tests had been administered.

The process: A core team was formed of designers, a nurse strategist, an organisation development specialist, technology expert, union representative. They worked with an innovation team of frontline staff in each of the four hospitals using a design process consisting of ‘human-centred discovery followed by iterative cycles of prototyping, testing and refinement’.

The result: The design that emerged for shift changes had nurses passing on information in front of the patient rather than at the desk. Within a week the team built a working prototype with new procedures and some simple software that enabled them to call up previous shift change notes, add new ones, and input information throughout a shift. The result was better knowledge transfer and better-informed contact with patients. Impact over time was measured and revealed that the time between a nurse’s arrival and first interaction with a patient had been halved, adding many more nursing hours per shift across the four hospitals. Patient experience improved along with nurses’ job satisfaction®.

Rapid prototyping

All action learning processes have a cycle of doing and reviewing quickly, with the aim of putting something into practice fast. Rapid prototyping is one such methodology which aims not ‘to finish’ but to use only as much time, effort and investment as are needed to generate useful feedback, to learn about the strengths and weaknesses of an idea and to identify new directions that further prototypes might take®. This is not the same as a pilot project where stakeholders have to agree in advance the goals, methods, timelines, resources, risk management, organisational impact and outcome evaluation.
Celebrate and reward

In a market place, the exchange of money for a service is transparent and takes place in the ‘here and now’. In public services the exchange often takes place at some distance in time and space – you paid your national insurance contributions years ago but you need a service now. There is a danger that the service provider doesn’t see herself as part of a fair exchange; as part of a national insurance policy. Instead she sees only demands upon her and feels used up. Economic incentives are only part of correcting this. What service providers care about is doing work that is both understood and valued. The challenge for leaders is to notice and demonstrate that they value the special demands of the work and to reinforce the reciprocity of relationships involved in this social contract. Sheila Adam is quoted in the Health Service Journal saying ‘Many staff in the NHS would be completely incentivised by the fact that they have simply improved the care that is being delivered to people’.

There are plenty of examples where the rewards of professional integrity, recognition and reputation are sufficient to encourage innovation. The important thing is to ensure that those who contribute to adopting, diffusing and sustaining are rewarded too, as well as those who discover and invent. One of the leadership tasks is to create a behaviour code that rewards team activity and recognises that contributing to a development that does not in the end ‘succeed’ may be just as important as contributing to one that does.

Reporting failures

An NHS Trust Board received a report of a service development in the treatment and rehabilitation of patients with chronic obstructive pulmonary disease COPD. This described the iterations which were undertaken before reaching a successful outcome. The purpose was to reduce episodes of hospitalisation and one of the requirements was that the service be valued by both GPs and patients. In the first year the evaluation showed that the redesigned service was valued by both groups but had failed to impact on hospital bed-days. So it was redesigned again and this time was successful in all three dimensions. The rather messy process of innovation was presented to the Board and not tidied up to obscure ‘failures’.

Another leadership task is to recognise the value of small improvements. Small evolutionary changes can lead to great developments, and we cannot predict which will be most significant.
4.3 Eliminate

In all evolutionary processes there has to be a mechanism for removing varieties that do not perform well enough in that environment. Death is a very visible example, though even a small reproductive disadvantage over many generations is effective.

Market forces ensure that if a product or organisation fails to generate profit, it will come to an end. In all but the very short term, profitability is the single and simple measure of success. Most organisations fail and cease to exist and this is a normal and healthy aspect of market behaviours. There are mechanisms in place like limited liability companies and bankruptcy laws to ease the pain when a company fails. And quite often certain functions and bits survive even if the company does not.

In public services, however, selection by ‘organisational exit’ is all but absent. We can live without Woolworths on the high street but we cannot live without a hospital in a major city or a school in each locality. The principle of universality means you simply cannot eliminate a service. Closing a residential home that isn’t performing well is not an option, even for a short transitional period, if it means putting the lives of elderly residents at risk. The service has to be improved, not closed down.

So how do we decide what and when to eliminate? What are the evaluative processes that offer alternatives to the market measure of profitability?

So what does this mean in public services?

We know from the research & development world that recognising when to pull the plug on development initiatives is really difficult, far harder than getting started or having ideas in the first place. But it is not just new developments that need to be eliminated when they are no longer the best use of resources. If our environment becomes crowded with existing practices that are not subject to the same kind of scrutiny as new endeavours, there is scant room for new shoots to thrive.

We suggest there are ways to make disinvestment easier in the public sector. One is to anticipate the possibility of failure. Another is to ensure that evidence is gathered, and evaluation is designed, specifically as a tool for deciding whether to disinvest.
Anticipate that not all will survive and remove the fear of failure

If we think of innovation as an evolutionary process then ‘failure’ is both inevitable and necessary. But failure is not a word that most of us live happily with. Does an evolutionary theory of change help?

It means understanding that an action learning cycle doesn’t fail if you learn from it; that negative results in an experiment do not signify failure. Organisations would need to find ways of explicitly acknowledging that a large proportion of innovations will not survive beyond the short term. This means a culture that can ‘tell the story’ in ways which recognise that contributing to an innovation that goes nowhere can be just as important as contributing to one that thrives. This would be a powerful way of removing the fear of failure that limits people’s resourcefulness. Investing in lots of rapid learning where there is an expectation that proto-types are discarded in favour of something better will give a greater return than demonstration projects where it is so hard for innovators not to become wedded to ‘their’ way of doing things. Having an innovation led not by the ‘champion’ but by someone without that degree of emotional investment may also help remove fear of failure.

Separate disinvestment from budget cuts

If disinvestment, or selecting out, is to be appreciated as a key component of innovation it is critically important that budget cuts are honestly described as budget cuts. Only if this is done consistently will people come to believe that disinvestments to enable innovation are not just cuts disguised as something else.

Evidence and evaluation

Is there something about the way we do evaluation that undermines rapid learning? Are our evaluation tools designed to try to demonstrate success rather than reveal when something is no longer good enough? What forms of evaluation enable us to know when to disinvest in a service? Given the timescale of change, how do we know when we have tried something for long enough?

If we only evaluate what’s new it is likely to be very hard to disinvest. Yet we seldom evaluate existing services. Perhaps the secret is never to make an investment decision relating only to a single service but always in the context of an investment portfolio that gets reviewed with every new investment decision (Not is A good, but is A better than B&C, in which case we need to disinvest from B&C).

Rapid feedback

We need ways to gather feedback about the quality of services as an alternative to the feedback that market mechanisms provides. Rapid feedback of outcome measures, particularly those that are patient-reported, are likely to be of particular value.
5. Promoting innovation

For more than a decade the Government has put improving performance at the centre of its policies for modernising public services. Where should the focus of this effort lie? What sort of organisational framework would be appropriate? And how can we grow a culture that supports innovation?

Trusting local resourcefulness

In the NHS £220 million has been allocated in 2009 to promote innovation. Strategic Health Authorities have been given a legal duty to promote innovation and will decide locally how to invest the money. The challenge is how to create the conditions that will support innovation that sticks. Rather than investing in rolling out best practice we hope the SHAs seek to invest in the capacity of all organisations to innovate and use the development money to support each team and organisation to take responsibility for its own innovation. This would mean creating an environment that gives attention not just to new ideas but to ways of amplifying promising adaptations and eliminating those that are not performing well enough.

An organisational framework

Innovation is context specific; local conditions matter. The literature on innovation reveals ‘growing realisation that many innovations – especially those that are complex – are primarily adopted by the organisation’. So how might we go about actively building a framework for innovation across an organisation?

If we think of organisations as evolutionary systems then the purpose of such a framework would be to address three sorts of questions:

- how do we generate variety in the shape of new ideas and practices?
- how do we amplify potentially useful changes?
- how do we eliminate services that are not performing well enough?

An NHS Trust which is committed to improving performance has set up an Innovation Steering Group chaired by the chief executive. An early decision was made to use middle managers to encourage their staff to come up with new ideas. They were trained in listening skills and asked to act in mentoring mode rather than managerial role. They were delighted, and surprised, at the number of good ideas this elicited.

But they have not as yet given attention to how to amplify and eliminate.
Creating a culture of innovation

Underpinning a raft of strategies to encourage service re-design and innovation is the notion of a fundamental shift in culture to re-invigorate the way services are delivered. The literature on organisational culture suggests that describing culture is not enough to change it; that it is ‘rules of thumb’ which govern how services are delivered; that what is needed are stories which reinforce or alter these rules of thumb, because stories are what hold and develop an organisation’s culture.

Our theoretical perspective is to view an organisation as a living system organised through the multiple and repeated interactions of teams and individuals. In such a system there is knowledge of what currently goes on, and the wisdom to know what needs to be done differently. However, this is frequently not translated into service improvements because the knowledge and wisdom is held in many places, and the people who make up the system seldom have access to each other ‘as a whole’. For change to happen, far more people than usual will need to understand the values and purposes held by others, and the principles or rules of thumb that guide ‘the way we do things around here’. When an organisation becomes aware of its culture in this way it may then be able to change its performance.

I’ve been working with a client trying to radically change itself. There is no shortage of good, new, radical ideas. People say Yes! and grab them and put them back into old processes and relationships and old information flows. They take up the new and put it into the format of the current culture, turning it back into the very thing it’s trying to change.

Stories

An organisation’s culture is held, developed and shared in the stories people tell about ‘how things happen around here’. Stories are a means of processing information about our worlds. They are one of the ways people use to navigate in uncertain times.

Stories can keep us stuck, and they can move us on. They usually hold our beliefs about cause and effect but in complex situations they may run the risk of highlighting only one cause, and only one solution. We trade the comfort of being able to confront our fears of the unknown with the cost of failing to imagine other possibilities. This has implications when we are trying to encourage innovation.

The story of Red Riding Hood tells us that if little girls go into the woods they can be eaten by wolves. If little girls go into the woods they can be eaten by wolves, unless they are saved by a rescuer. Other possibilities, like wolves being kept out of the woods or young women being given the means to deter or kill them, are not options in this story.

Many of the stories we currently tell ourselves about innovation are stories about intelligent design, not about evolution. The seduction into intelligent design in this context is the desire to reduce uncertainty and cover up the unpredictability of ‘progress’. Stories may reference the reality that most innovations fail to thrive but these are usually stories designed to propose ways of spotting what is likely to succeed, and thereby control the process and ensure success. Thus we hope to avoid the inevitability of dead ends, false steps and extinctions.

In a culture of innovation the stories that we tell would need to include the elements of generating, amplifying and eliminating.
Small steps
Stories about innovation often describe ‘quantum leaps’ and examples of dramatic change in designed systems – words like high impact, step change, disruptive innovation, progress, radical change, success – almost all positive notions, even although we know that innovations can be harmful too e.g. financial derivatives like collateralised debt obligations. And innovation is often contrasted with the apparently less exciting process of gradual, continuous improvement. But small evolutionary changes can lead to great developments. Any level of light-sensitive receptor located at the bottom of even a shallow pit in the skin confers great advantage and may lead to the development of a sophisticated organ like the eye – not as a single leap but as a result of multiple small improvements. We do not know when, or how, small changes will contribute to big changes.

An example of small change, big impact
A health service manager recognised that doctors come to work each day wanting to do the best for their patients, but as the day goes on they become ground down by their working conditions. He re-scheduled all his meetings with doctors to 8am and found that challenging issues, which had remained unresolved for months, were rapidly resolved. A small change in meeting time, a big leap in operational effectiveness.

An organisation with a culture of innovation would tell stories of ways in which lots of small steps towards improvement added up to something that is qualitatively different.

Inter-connections
Other stories we tell are really about the process of invention but, unlike the lone inventor, the innovator needs social relationships to create lasting change. Innovation happens when human behaviour changes. It is not a solitary activity but one that takes place over time through the interaction of many people. An organisation with a culture of innovation would tell stories that help people to recognise the social context of innovation, and their place within it.

Innovation of services
When asked for examples of innovation we often come up with things like the internet, mobile phones, upside down sauce bottles – almost all products or technological advances. But public service organisations are about delivering services. The service organisation needs its frontline staff to act autonomously and creatively and senior people know that most of their organisation’s capacity for innovation is to be found at the frontline.

An organisation with a culture of innovation would tell stories to illuminate innovation that arises from appropriate variation in the way services are provided.
Persistence

We believe there is no shortage of good ideas in the world and we believe, too, that most inventions or novel ideas fail to be put into practice or production. And yet reporting bias means that we usually tell the story as though good ideas inevitably get recognition. The danger is we lose our tolerance of failure. We would be better served by stories that describe how innovators have tried and failed and tried again, perhaps many times. The ability to keep on going – leadership as patient persistence – may be one of the most important characteristics of innovators. And one of the most important characteristics of an innovative organisation may be its willingness to accept that many innovations result in failure.

An organisation with a culture of innovation would tell stories where a series of failures led to a useful innovation.
IN SUMMARY…

This paper is about the organisational and system factors that impede or facilitate innovation. We offer a way of thinking about innovation as evolution. This way of thinking helps to clarify the very different challenges facing those trying to stimulate innovation in the public and private sectors.

Innovation as evolution requires three key elements which constantly interact:

**Generate** new possibilities. It is widely assumed that people working in public service organisations need stimulation to come up with new ideas. We suggest that when managers listen to the ideas that people have, they discover a wealth of new possibilities.

**Amplify** positive adaptations. Market mechanisms are able to provide innovations with an income stream, but no such automatic amplification is available in public services.

The commonly held model of change about the spread of innovation in public services is a *push model* of amplification, in which effort goes into disseminating the results of demonstration projects and best practice. Instead, we propose a *pull model* with a focus on internal strivers, rather than external drivers. We suggest that the take-up of new ideas and practices is highly dependent on the readiness of the adopters, and that support for innovation should be focused on nurturing this readiness.

**Eliminate** adaptations that are no longer useful enough. Market forces provide effective ways of eliminating products or businesses that fail to generate a profit. This is a normal and healthy aspect of market behaviour. Public services require alternative mechanisms. If we only evaluate what’s new it is likely to be very hard to disinvest. Public services need a mechanism by which all services, established as well as innovations, are evaluated as a portfolio of investments, and the least valued are eliminated.

We offer the beginnings of an organisational framework for promoting a culture of innovation.
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Innovation and Public Services: Insights from Evolution

This paper is about the organisational and system factors that impede or facilitate innovation. We offer a way of thinking of innovation as evolution. This helps to clarify the different challenges facing those keen to stimulate innovation in public services and in the market.

If we think of organisations as evolutionary systems then the purpose of a framework to stimulate innovation would be to address three questions:

- How do we generate variety in the shape of new ideas and practices?
- How do we amplify potentially useful changes?
- How do we eliminate services that are not performing well enough?