



## **Public services innovation through technology**

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Governments struggle to understand how technologies may be used to innovate in the development and delivery of public sectors. Frequently technologies are seen as quick and effective fixes for problems that may run far deeper than obvious process and user dynamics. As often, solutions are considered as 'point provision' and as such fail to recognise the complex co-evolution of society, economics, the world outside a government's borders and control, and the technologies themselves. This paper summarises a number of key areas that must be understood in order to effectively innovate through the introduction and management of services mediated by new technologies.

# Public services innovation through technology

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## Abstract

Governments struggle to understand how technologies may be used to innovate in the development and delivery of public sectors. Frequently technologies are seen as quick and effective fixes for problems that may run far deeper than obvious process and user dynamics. As often, solutions are considered as 'point provision' and as such fail to recognise the complex co-evolution of society, economics, the world outside a governments borders and control, and the technologies themselves. This paper summarises a number of key areas that must be understood in order to effectively innovate through the introduction and management of services mediated by new technologies.

## The big idea

Technology is frequently perceived to be *the* answer to economic and performance challenges in the delivery of services by governmental organisations. Increased productivity and agility play major roles in the arguments put forwards for reorganisation and investment (for example the Gershon report) within government. A dominant view of information technology within government is that automation is universally good, reflecting a widely held belief that since computers are 'universal machines' they can ultimately perform any and all data manipulations involved in managing processes.

Within industrial services organisations as diverse as banking, engineering and assistive technologies, it has become increasingly obvious that this is not necessarily the case. Technology and its users are co-dependent, they evolve together and changes in one either enable, or sometimes force transformation of the other.

This paper discusses some of the important dependencies that services and technology impose on one another, specifically in the context of government-led or -enabled services and information systems technologies. It is intended to highlight some of the problems inherent in isolating considerations of technology, business and society and to promote debate as to the best ways to encourage the development of and then exploit new information technologies within services provision.

The paper is split into nine parts — each of which could become a full paper in itself:

- Information systems alignment — what is it and how do we achieve coherence between the objectives of a service and its provisioning?
- Should governments innovate and why?
- Co-evolution of services, policy, economics and technology — how can we understand the imperatives, what can we control and what are the benefits?
- Lowest cost vs. best service — how mature are attitudes to information systems provisioning within services?
- Agility — what does this mean in the context of government policy, now and in the future?
- Who is the customer — government or user, how are customers represented and how can their needs be taken into account?
- Personalisation — valuable or a distraction from key services development?
- The digital divide — a fantasy or a source of conflict and stagnation to come?
- Commercial and social services innovation — where are the synergies and how do we encourage co-development?

## Alignment, alignment, alignment

In the private sector, there is a constant demand that IT be ‘aligned’ with the business. In many ways, this confuses the dual nature of the relationship. All IT systems are **designed** to achieve certain ends. It should not be forgotten that this designed nature extends beyond the ‘input’ screens seen by the operators, but to the language of the business logic layer which produced the screens, the functions of the middleware layer which gathers the data together, the operation of the databases that provide the information, and the multiple operating systems upon which all of these layers operate.

Each of these elements is intended to present an abstraction of the totality which they can address. Inevitably and intentionally these abstractions both enable and restrict the kinds of operations the system can perform. Choosing these abstractions correctly — they are very costly to change — to match the business requirements is particularly challenging. Unfortunately, this challenge does not arise as a consequence of the IT industry being unaware of the consequences of abstraction. It arises because almost no business organisations actually understand what they do! As Micheal Hammer observed:

To this end, a contemporary measurement system must have two basic features. First, all data must include a rationale and a purpose; people must know why things are measured and, more important[ly], what they are supposed to do about them. Second, all measurement must be based on a careful analysis of the business, one that links the objectives of the business to the things over which managers and front-line personnel have control. Only then can the recognition of a problematic measure lead to the right actions that will correct it and to improved performance of the business as a whole.

*Michael Hammer, Leader to Leader, No. 24 Spring 2002, full article.*

This naturally begs a set of very important questions:

- What should an IT system provider align with?
- How should such requirements be expressed?
- How much coupling should there be between these requirements and some proposed ‘future’ — social, political or economic?
- How should requirements designed for the ‘now’ or at the very most the ‘near future’ be tracked and managed to reflect changes within the environment?

In the context of a socio-political systems, current and future implementation of services are (hopefully) influenced by changes in government. Consequently even if a current government achieves the clarity of view advocated by Hammer, for how long would this view persist past an election. To use an example still sensitive within industry and government, the rate of policy change to simplify the implementation of the Child Support Act (CSA) was greater than the revision release cycle the system operator had in place. As any controller engineer is aware, attempting to drive a system faster than its fundamental response rate will not deliver the desired outcomes.

From the political perspective what should be a pressing issue is that a system that is completely aligned to the current service requirements may prove impossible to change. One of the well known properties of ‘optimal’ systems is that they are very fragile to change. Consequently a currently well aligned system may well be poor outcome in terms of enabling the range of variation of future political policy that should be accommodated.

In this context, the question of alignment is not just one of the current requisite functions of the system, but the dynamics of the social context in which it will exist. How can alignment to those potential futures be established? Given the fundamental imperative of cost reduction — how will any additional, and therefore costly features permitting future, possibly unnecessary or indeed politically unpalatable, variation be accommodated?

Who should establish that alignment has been achieved? In large IT systems projects, requirement change during the construction of the project are the norm. System prototyping and/or a prototyping roll out order are usually ignored as adding cost to the system. As requirements are often both poorly understood and poorly expressed identifying who is to blame when they are not met in the deployed implementation is difficult and reduces the ability of the purchaser and provider to work in partnership.

## Should government innovate?

Innovation is for many individuals an attractive activity. Successful innovation is associated with creativity and success. In many occupations one of the clearest achievements any individual can point to is their contribution to the introduction of innovation. Indeed, in our current economic system, the innovator ranks just below the entrepreneur in terms of their perceived social value. In this context, it is clearly tempting for government employees to be seen to innovate but what does

innovation mean in a government services setting? The services a government offers are established by primary legislation and/or ministerial order under enabling legislation. As a result, the scope for innovation lies solely within either optimisation of the current offering (essentially cost reduction) or novel interpretation of the intent of the legislation — clearly liable to judicial oversight. In this context the primary sources of innovation can be identified as

- new primary legislation,
- new ministerial orders,
- input from think tanks,
- re-organisation from management consultants, and
- improvements indicated by staff.

Large-scale innovation of services, government or business, is often seen as potentially the most beneficial, while in production systems micro-scale innovation, for example ‘kaizen’ approaches, are often identified as giving the greatest benefit. Given that government services are inherently ‘top down’ deriving, in principle, from some form of legislation it is very difficult to see how micro-scale innovation can be included within such a system. Equally, if such innovation is encouraged then different geographies will inevitably acquire different services as a result of local innovation. Whilst they may be desirable, both as a test bed or indeed as a response to particular local need this may be discouraged for political reasons (for example the outcry about ‘postcode lotteries’ without an equivalent consideration of ‘local innovation and optimisation’).

The nature (or indeed absence) of debate about the impact of localised innovation, the impact of that localisation on systems robustness and agility, and the dissemination of best practices — social and technical is ripe for exploration.

## Co-evolution of services, policy, economics and technology

Government services provision arises as the result of the co-evolution of services, policy, economics and technology (SPET). Any system which is the result of the dynamics of four underlying systems is inherently complex. How should we understand the evolution of such complex systems? Many organisations employ ‘futurologists’ but commonly their remit is limited to a consideration of individual subsystems as opposed to the relationships between and the co-dynamics of the SPET. This leads us to ask the very obvious question as to whether it is possible to understand the impact of change on any single component of the SPET system on the totality of the system.

Given that we wish to introduce a change in any of these components how do we test the consequence of the change, what scale of prototyping activities are necessary, how long should they be undertaken for to return valid data and how do we establish the validity of the experimental data?

In a broader context, can we protect the experiment from external interference — clearly reporting of a valuable ‘new service’ being available at one particular geographic location may cause people

to source the service from there, consequently changing both the scale of the test and potentially the nature of the recipients of the service. If trials of a service are successful, how should it be introduced — the entire target group as a ‘big bang’ or rolled out in a geographic pattern that minimises cost? Alternatively, if these services are critical, should they be rolled out in a form that maximises the validation of the data from the prototyping and consequently reduces risk?

Each of these choices can have a considerable impact on the success or failure of the final service delivery. It is widely recognised that the introduction of new facilities can both encourage users to exploit them in the way in which they were intended, but can also introduce new ways of working — often unforeseen, humans being both highly adaptable and also very innovative. It is essential that we understand not only what the impact of this co-evolution of behaviour and services is, but also that the benefits can be clearly articulated to the user — benefits in cost, experience, time — whatever they may be. If these benefits cannot be achieved then political support for services innovation is difficult to sustain. In the absence of ‘credit’ for achievements then politicians will inevitably look elsewhere to justify their activities to their electorate.

## Lowest cost, best service, or both?

When innovating within a service, determination of intent is essential. Is the aim to improve the quality of the service or is it to reduce the cost of the service provision? Whilst it is often claimed that services innovation will deliver both of the outcomes, this is rarely achieved. If such trade offs are to be ‘tested’ then variation in services provision will need to be permitted. However, there is a major problem in the acceptability of this approach. A compelling example is the response to variation in availability of certain drugs under the NHS. One might argue that it is reasonable for different parts of the NHS to experiment with the consequences of making different drug regimes available for different conditions. Unfortunately, the equally reasonable perception that the NHS is a national body and as a result its provision should not vary over the country, is also widely held. The collision of these two views is largely played out in the media often with the help of other stakeholders PR resources. This, albeit emotive, exemplar — but then almost all social provision is emotive: who wants to be on the receiving end of a failed social provision experiment? — demonstrates that, whilst service differentiation may well be desirable from an innovation perspective, it is unlikely to be politically acceptable.

## What is government-services agility?

Given the context in which government services are designed, legislation and ministerial order, what does agility mean in this context? Is it the ability to respond to legislative change in a timely and orderly manner, or is it the ability to optimise against the current requirements? In simpler terms is the ambition cost reduction or capability enhancement? Again, the IT ‘have cake and eat it view’ is that both can be simultaneously achieved, but this is almost never the case. Capability enhancement means that there are system parts capable of extension, that are not currently being used. This implies both extra capital costs, the purchase of the capabilities, and extra running costs from the increase in the system complexity. It immediately follows that a system with extra capabilities can never be the minimum cost system. Indeed, the more any system is optimised to

the current setting the harder it becomes to change, in many instances a fully optimal system can only function against the current requirements and freezes the solution at the current point in time.

Relatively few large services programmes appear to make use of extensive scenario testing against which rational discussions of the value of agility can be had.

## Who is the customer?

In any economic exchange system, it is important to recognise the customer. In most economic systems efficiency is achieved by the use of a market. However, for government service provision it is unclear who the customer for service actually is. Given that the customer **must** hand over some tradable item to the provider in return for the service, for a government sourced service that customer is the government itself. The government should be a well regulated monopoly supplier and consequently the cost of the service in this form of provision should be optimal. However, competition in provision of any good or service is widely accepted to lead to innovation and improvement. How can there be meaningful competition on government service provision? How can the customers represent their views by moving to an alternative provider with the service still being provided by the government?

Many social services are extremely inefficient when run on competitive lines, despite the protestations in the absence of evidence of certain economists. If the **user** is to be the customer then they must have a numiere to exchange. If this is genuinely tradable then it will be equivalent to money and consequently exchanged for such. Given that the intent of many government services is to ensure, at least, minimal social provision (food, housing, health, education, lottery tickets . . .) it is clear that tradability of these entitlements is highly undesirable. So given competition implies trade, then how can this be achieved in the context of social provision?

## Personalisation — to what end?

One of the major drivers for innovation in government services is to ‘personalise them’. That is to match services delivery to the requirements of the individual. In the business market this can be likened to the ‘segment of size one’ aim. That is, that any product or service can be customised to the extent that there is essentially one instance for every individual. The problem of this view is that very few individuals can afford to pay the costs of achieving that degree of personalisation. If that cost is not borne by the individual, then why should it be borne by society? Essentially, what is the societal gain in personalising a service down to the individual? Already there is a major issue that particular groups within society, the well educated middle class, are better at exploiting social service provision than other groups within society. Is personalisation (and digitization) of these services simply a way to extend the benefits of being within this group? Politically this may be acceptable as this group is both vociferous and votes, but is that a good basis for service innovation?

## The digital divide — fantasy, construct or a growing problem?

The move to technology based service provision is explicitly one of digitisation. In this setting access to digital media will become a primary requirement of the citizen. In fact it is not just access to digital services but the ability to exploit them effectively. The ‘digital divide’ has an impact not just in the access to services, which is of course important, but also in the ability to use them once they have been accessed. Will this move in service provision simply re-inforce the advantages the educated and well connected in society already have in using social service provision? There is little point in providing social access points if the users are incapable of interacting with the services systems reached. The models of interaction forced on the user by automated systems are not necessarily natural to many of the services constituency. With all automated systems, it is exceptions to the automated process that tend to have the greatest economic impact, more and more so with greater automation. One consequence of the ‘digital divide’ is that savings from digitised services may well be illusory as the majority of the user base may well force exceptions as they cannot or will not interact correctly with the digital version of the service.

## Commercial and social services innovation

With the inevitable problems for innovation that a government’s scale brings, often the government looks to commercial interest to bring innovation into its activities. But to what extent can such organisations bring innovation into government services? How do they benefit from innovation and in particular who owns any intellectual property (IP) developed? The primary driver of bringing in commercial organisations is the perception of commercial discipline and the belief that this will reduce costs. However, if there is no benefit to the commercial organisation, outwith the direct economic return of the outsourcing contract, why would or indeed should they innovate other than to reduce their costs of delivery? Clearly a more well balanced approach would be to use these contracts to learn and improve on both the delivery and the quality of the service. Historic disputes over the ownership of IP in such contracts have, however, lead to wariness on the part of the contracting party to either sharing IP or allowing the commercial organisation to own it. IP has been exploited by commercial organisations as a method of achieving ‘lock in’ as a supplier, and clearly that is a situation which government cannot permit. If, however, the commercial organisation does not own IP developed in response to innovation requirements in this setting, what interest will they have in developing it for further exploitation.

## Conclusions

Services innovation in the government setting is a complex problem that cannot be addressed solely from the view of technology. Technology, and innovation there-in, is an important part of the SPET system but it is by no means the dominant one. The plurality of stakeholders with different and competing interests in government systems is a particularly demanding one to resolve. It is easy to bleat that ‘IT must be aligned’ and blaming it for any consequent failures, whilst not actually providing meaningful targets to align against. The dynamics of the social-political environment, in particular its interaction with the media in respect of any perceived unfairness in provision, is a very demanding theatre to innovate within. Squaring the circle of cost reduction vs service improvement

is an enormous challenge in its own right. The perception that synthetic market mechanisms are the only route to service improvements is also a major block to achieving change.

HP Labs has been working on methods, which we refer to as ‘Open Analytics’, for achieving agreement between stakeholders and producing meaningful targets to align against. This approach places shared models of the service requirements at the heart of the problem resolution, and exploits them throughout the lifetime of the service to understand its effectiveness with respect to the multiple stakeholders.