

# INNOVATION BY DESIGN

## An invitation to NHS Organisations to explore learning about innovation within complex, networked organizations.

By Dr. Marc Gerstein, Dr. Iris Ginzburg, Alastair Mitchell-Baker and Simon Thane.

### Introduction

Every NHS SHA, Trust and PCT executive aspires to lead a successful, innovative and self-improving organisation. They are urged on from many quarters. Not least Lord Darzi's Next Stage Review 'Our NHS, Our Future' focuses on the need for the NHS to adopt new products, procedures and processes. The hope is that innovation will contribute to a 'self-sustaining, self-improving' NHS.

A quote from the Next Stage Review highlights this vision:

*'Our researchers have made a great contribution and will continue to do so. However, too often innovation has been defined narrowly, focusing solely on research, when in fact innovation is a broader concept, encompassing clinical practice and service design. Service innovation means people at the frontline finding better ways of caring for patients - improving outcomes, experiences and safety. In this country, we have a proud record of invention, but we lag behind in systematic uptake even of our own inventions.'* (p. 55, para. 38)



Since each SHA now has an obligation to systemically improve innovation, especially adoption and diffusion, within their patch the problem turns to answering what NHS leaders can do to meet this aspiration. We think that a leap forward is needed by SHAs to better equip themselves and their local NHS organisations to make a significant change in innovation practice.

In this paper we will:

- Briefly lay out some key innovation concepts for complex, networked organisations, like SHAs and NHS trusts;
- Quickly review current thinking and progress on innovation within the NHS;
- Reflect on the innovation practices of a successful large, complex, service organisation, namely IBM; and
- Note some of the questions and gaps in our thinking and highlight some fruitful areas for further thought and study.

With your interest hopefully stimulated, we will invite you to join us to explore these ideas further and network with others who want to get ahead in this field.

### Innovation in complex, networked organisations

The innovation process is often conceived in three stages: invention, innovation and diffusion; the so-called 'Schumpeterian trilogy'. As the introductory quote from Lord Darzi makes clear, it is in the latter stages of this process that the NHS appears to struggle.

In reality, for any large, multi-faceted and networked organisation the innovation process is unavoidably complicated and difficult. NESTA describes it as 'a complex and interactive process involving multiple feedbacks between different services and functions as well as manifold interactions with customers and suppliers'. Medical device innovation, in particular, exhibits a high degree of iteration. After the first products enter the market, continued technological development, user feedback, and procedural and administrative changes are needed to maximize the new technology's utility.

Innovations also vary by type, further complicating both development and adoption. For example, we can usefully distinguish between new goods and services ('products') and new production or delivery methods ('processes').

It is also useful to distinguish between 'fundamental' innovations - one-time disruptive events, such as technological breakthroughs like the CT scanner - and 'incremental' innovations that reflect the synergistic effect of new drugs, devices and approaches, such as surgical enhanced recovery programmes.

Finally, even after an innovation is found to be successful in one setting, institutional diffusion and adoption is affected by complex 'whole system' interactions between individual champions, clinical and work processes, budgets, organisational culture, and political forces. Many well-known psychological, organisational, and budgetary barriers, such as not-invented-here, management overload and insufficient training resources are commonplace barriers to adoption.

An overview of the current complex NHS organisational landscape for innovation is given in the appendix.

### ***NHS innovation as a 'wicked problem'***

So-called 'wicked problems' resist definition and solution, and their resolution inevitably requires behaviour that runs counter to intuition. Doing more of the same, and pushing harder, simply does not work.

In fact, if we reflect upon those factors that stop the NHS from simply applying best practices from lean manufacturing and high-tech commercial companies to its own innovation challenges, we gain important insights into the differences between the NHS and these superficially similar organisations.

First off, we must consider whether the NHS' innovation difficulties are driven by sheer scale. While the NHS is, along with the Red Army, one of the world's largest organisations, size isn't the only key factor slowing innovation, even if it surely makes the task more difficult.

Unlike most private companies, the NHS is not a single organisation, but rather a community of Trusts and other organisations, each individually not that different in scale from many large-scale businesses. Regulation and politics also make things more complicated. But even this is not the full story.

But why isn't the solution simply adopting those practices proven to work for other sectors? Surely better project leadership, more programme management, cleverer top-down change management, more effective continuous improvement and clearer, far-sighted new technology and pharmaceutical pipelines should make an enormous difference. They almost certainly would, but the problem is not that simple.



What's the key then?

Power and the ability to influence innovation in the NHS is also distributed both in formal organisational terms [across DH, national bodies, SHAs, PCTs, FTs and other Trusts] and particularly in the key role of clinicians and the medical profession in particular. This can result in a systemic 'innovation veto' as ownership of clinical need and professional knowledge, authority to make things happen, and control of resources are distributed between and across organisations.

Simple translation of effective methods developed elsewhere doesn't work because hospitals aren't factories, patients aren't products and clinical procedures aren't just customer services.

Of course, there are certain areas of hospitals that are factory-like (pathology labs), and there are patient pathways that are high-volume, linear and largely predictable (cataracts or hip replacements). On the other hand, many patients are non-standard or present with multiple-conditions. And all patients need to be treated with compassion as the complex human beings they are with physical, mental, emotional and social needs as well as medical conditions. This requires multi-disciplinary and multi-

professional teams navigating within complex, changing organisational structures, themselves embedded within larger systems that often aim to achieve irreconcilable economic and policy objectives. As complex as they may be, manufacturing and commercial enterprises are systemically simpler and their investment decisions around innovation are usually more clear cut.

## ***A path forward: leveraging insights from service organisations***

In recent years, innovative service companies have also come to recognise that innovation is harder for them than for manufacturers. Unlike manufactured products, services are intangible and often based upon human interaction. While some experts have argued that the distinction between these two categories is occasionally arbitrary, there is still something fundamentally different in our view.



According to research, one of the curious aspects of successful service innovations is that senior managers are often more involved as idea creators and as project managers than in the case of manufactured products. We believe this may be related to the need for new services to change the organisation's *business system*, our term that combines its economic business model with the organisation's core technology and basic organisation design.

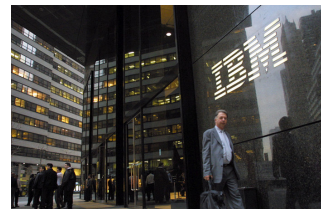
In some cases, such as the iPod, changes extend well outside the innovating organisation, and thus rely upon - if not demand - the intervention of the highest levels of management. In contrast, many manufactured product innovations do not require a wholesale redesign of the enterprise. In fact, it is the stability of the manufacturer's production, marketing, selling and service organisations that permits R&D and new product development to operate with great efficiency. Of course, when there are fundamental changes, such as the shift from chemical-based to digital photography, as was faced by Eastman Kodak, an equally great organisational transformation is required.

If this difference is true for innovative service companies, we think it is doubly true for the NHS. Innovation lessons from high volume, lean manufacturing environments are valuable for the NHS, but only if properly focused, and not taken too far. The NHS needs to go beyond, understand the differences that set it apart from less complex organisations and also build-on lessons from complex and successful service companies.

Let's now look at innovation at IBM before returning to the NHS.

## ***Innovation lessons from IBM: clear objectives, organisational alignment and flexibility***

Innovation has always been on IBM's agenda and it is reflected in the company's strategy, core values and past successes. Despite the company's compelling track record of cutting edge innovations, however, (IBM is the world-leading company in the number of patents listed every year and it has five Nobel laureates working in its labs), the company has had a remarkably hard time turning many ideas into successful new businesses. Many important inventions, such as the relational database and the now-ubiquitous communications router, were converted into large businesses by other firms such as Oracle and Cisco, not by IBM.



The root causes lay in what may sound like a familiar pattern within the NHS. In the late 70's, IBM was focused on short-term results and current market needs. Although it devoted resources by establishing and nurturing its distinguished Research Division, IBM did not devote sufficient management attention, resources, time or talent to new business development at the cross-divisional or corporate levels. In fact, IBM seemed culturally incapable of doing so. Irrespective of its many technological breakthroughs, the company suffered from an 'invisible fence' between its research labs

and the development activities that translated new ideas and technology into being ready for the marketplace. Rather than science, the latter step requires a keen understanding of customers, marketing and competition.

In response to this and related problems, IBM has in the last three decades developed an ever-evolving 'innovation ecosystem'. For instance, in the 80's IBM established the Joint Programs, a mechanism connecting the research labs and the development efforts by linking these activities throughout the innovation process, starting with joint funding of projects, collaborative project management and the systematic transfer of know-how from research to development. In 2000 the company established an Emerging Business Opportunities (EBO) programme to identify and nurture new lines of business. Further focusing on the schism between research, development and the marketplace, it institutionalised the First Of A Kind (FOAK) programme, where a relatively small investment (circa \$1m) is invested in people to work together from research labs, development labs and clients to develop and test new ideas.

### ***What are the principles behind IBM's innovation ecosystem?***

Five broad principles shape IBM's overall approach:

1. The innovation system must be aligned with the organisational environment. In other words, in a diversified and complex organisation like IBM, the innovation system must match the firm's scope and character. A distributed and global organisation like IBM requires an innovation system that should be highly adaptive in the absence of formalised central control. For example, there is no one person or group at IBM responsible for company-wide innovation. Instead, new innovation programmes are initiated at mid-senior management level. However, to ensure that this occurs, developing new innovation programmes is considered by IBM's top management to be a highly valued and rewarded organisation skill. This aspect of the organisation's culture and practice is key.



2. A successful innovation system must comprise multiple innovation programmes that address a broad variety of innovation types. IBM examples include the two programs mentioned above, the Emerging Business Opportunities (EBO) programme that focuses on the creation of new businesses and the First Of A Kind (FOAK) programme that emphasises cutting edge technologies, as well as running systematically company-wide events (that were recently broadened to include family members and selected business partners) called Innovation Jam, and a fairly recent programme, Global Innovation Outlook (GIO), in which IBM works in collaboration with external experts to predict innovation trends worldwide.



3. In putting together the overall innovation strategy, each innovation programme must be designed with clear goals, a dedicated budget, well-defined resources and defined participants (specific divisions, departments and, if relevant, external partners). Innovation programmes are thus managed in a way that maximises the likelihood that they will succeed.

4. Since it takes time for each innovation program to build its internal reputation and gain the respect of the organisation, realistic time-frames are essential. Expecting too much, too soon creates unachievable expectations, inevitable disappointment and a reluctance to try again.

5. Innovation activities within IBM are often best thought of as "practices" not "processes". That is, each programme is likely to follow steps that are only loosely defined to allow for redesign and fine-tuning as it evolves.

### ***The challenge of translation to the NHS***

The NHS has similar challenges to IBM as the Next Stage Review points out. Should SHAs explore a similar concept to creating EBOs? Would it make sense to appoint a top executive and clinician to

explore a new service, or to address a key need or opportunity, rather than merely encouraging existing organisations to pay attention to such issues?

These and other questions are raised under five initial themes below:

### **Innovation leadership**

To what degree is the fostering of innovation seen to be critical to success at various levels of NHS clinical and managerial leadership, especially in more senior positions? Will the incorporation of promoting innovation in SHA duties and PCT's World Class Competences be sufficient to challenge the inherent conservatism that most leaders have grown up with in the NHS?

### **Availability of 'slack resources'**

In general, innovation requires some freedom of action. Few innovations return in-kind benefits immediately; most produce improved service but require financial investment, while others are classical investments, producing their economic returns down the road. To what extent, therefore, can the NHS budgeting and financial control system facilitate making investments in new equipment, technology, training and new process development? How can it support when necessary corresponding disinvestment? Also, to what degree and in what manner do potential improved patient outcomes or public health benefits influence the funding of innovation initiatives?

### **Organisation design changes to simplify innovation diffusion**

In a number of cases, innovation is complicated by organisational differences in size, technological variations and other 'architectural' factors – these can be within and between organisations, and in the design of the national innovation enabling and supporting bodies. To streamline innovation, it often makes sense to reduce this variation, even at the cost of some disruption and potential loss of short-term efficiencies.

### **Opportunity identification/priority-setting**

The management of innovation typically involves some form of centralised leadership (such as that required to initiate some of IBM's major programmes like the GIO) combined with decentralised, loosely-coupled activities. While the design and evolution of the innovation ecosystem should not (and probably could not) be fully specified, some degree of leadership, priority-setting, funding, incentivisation and coordination is likely to be beneficial, especially at the outset. This applies at a national and regional level as well as within individual local health and academic communities and their constituent universities, trusts and commissioners. .

### **Change management**

Whilst it is well recognised that innovations inevitably generate the need for change, the degree of individual and organisational adjustment is often substantially underestimated. Training programs are chronically under-funded, and the knock-on effects of procedural changes arising from new equipment often go well beyond the boundaries of the people at the sharp edge of the change. SHAs have a significant opportunity to influence local NHS bodies through offering careful targeted innovation training and support,

## ***Conclusion and invitation***

In this paper we have laid out some key concepts around innovation in complex, multi-faceted and networked organisations, like the NHS. We have explored how the innovation practices of a successful large, complex service organisation, namely IBM, has resonances and parallels with the challenges facing the NHS.

With your interest hopefully stimulated, we should like to invite you to explore these ideas further with us and to continue the shared journey with others who want to get one step ahead in this field. We will seek to contribute to and facilitate this discussion across interested NHS organisations together with appropriate perspectives from external organisations, in a way that takes appropriate account of the emerging national policy direction.

If this is something you would like to join in with, please contact:

Alastair Mitchell-Baker, Tricordant Ltd.,

Tel: +44 (0) 1189 426826,

Mob: +44 (0) 7775 684868,

E-mail [alastair@tricordant.com](mailto:alastair@tricordant.com).

#### **Notes about the authors:**

***Dr. Marc Gerstein** is a widely recognized expert on strategy, organization design and risk management. He holds a masters and a PhD in management from the MIT Sloan School of Management. He has taught at Columbia Business School and Sloan. He currently heads Marc Gerstein Associates Ltd., a management consulting firm, and is President of the Organization Design Forum, a professional organization. He is author of three books including the recent 'Flirting With Disaster – Why Accidents Are Rarely Accidental'.*

***Dr. Iris Ginzburg**, CEO of Demaya Innovation Practices, provides innovation services to large organizations in Israel and around the world. Prior to establishing Demaya, she initiated and globally led IBM's Innovation Management Practice, part of IBM's On Demand Innovation Services. She holds a PhD in Physics from Tel-Aviv University and an MSc in Management of Technology from MIT Sloan School of Management.*

***Alastair Mitchell-Baker** is a founding director of Tricordant Ltd., a consultancy specialising in whole systems organisation design, with a strong presence in the health sector. He previously worked for 15 years in the NHS, including as a Chief Executive and in acute, mental health and community services. He is currently a Non-executive Director of the South Central Ambulance Trust, Associate Board member of the NHS National Technology Adoption Hub. He is a Natural Sciences graduate of Cambridge University.*

***Simon Thane** is also founding director of Tricordant Ltd. He has led organisational design projects within the NHS and for corporate companies. Previously he was in automotive manufacturing where he led factories employing up to 2,200 people. His expertise is in 'Lean' having run operations supplying just-in-time to customers such as Toyota and Honda. He has a first in Engineering from Cambridge University and a MEng in Manufacturing Business.*

## Appendix

### **The current NHS innovation landscape**

Following Lord Darzi's Next Stage Review report there is currently much interest and even excitement across the NHS about the 'innovation agenda'. The aspirations and ambitions laid out in the report have kindled a wave of expectation and in many places a flurry of activity. There are mapping exercises underway, new fledgling partnerships being discussed and even long-term organisational blockages disappearing in the rush to establish AHSCs (Academic Health Science Centres).

The 'innovation landscape' of the NHS is already acknowledged as complex and confusing. Key aspects include:

- Local NHS providers' autonomy in identifying and procuring technology and developing and adopting service innovations. The reality is of the NHS as an interconnected system of 600 separate frontline organisations, often with a 'not invented here', or even 'not evaluated here' mentality.
- An increasingly diverse range of independent providers who might more easily bring innovation; or represent innovation in the case of Independent Sector Treatment Centres (ISTCs).
- The services of these providers are increasingly being shaped by commissioners in PCTs, PBC and specialist commissioning groups.
- SHAs with their key performance management roles and new duty to promote innovation.
- Clinical networks working in defined services, such as cancer, across providers and commissioners in a geographical area.
- Professional bodies and groupings supporting and lobbying policy makers, organisations and staff.
- Complex procurement systems at Trust, Regional (collaborative procurement hubs), and national level (outsourced NHS Logistics and PASA).
- A complex network of national innovation bodies including those involved with horizon scanning, evaluation (such as NICE, HTA and CEP), promoting technology innovation (such as the National Innovation Centre and Regional Innovation Hubs), and supporting adoption and diffusion [such as the Training Hub (THOTH) and NHS Technology Adoption Centre (NTAC)].
- NHS Institute for Innovation and Improvement which includes a particular focus effectively on service improvement 'R&D' for dissemination across the NHS.
- Research and Development including OSCHR, NHIR, MRC and medical charities. Some of the research programmes supported directly cover 'the adoption of innovation' as well as research.
- Industry - both large companies and, especially in medical devices, a lot of SMEs.
- Wider UK and EU government departments and bodies with an interest in NHS innovation such as Technology Strategy Board (and sponsored KTNS and Innovation platforms), DIUS, BERR (and their sponsored RDAs) and NESTA.

*In the midst of this complex organisational landscape, there is also considerable uncertainty as many parts of the (NHS) system await clarification and direction from the centre. What does the SHAs' duty to promote innovation actually mean? How much money will they have? What can they do with it? What will the future hold for Regional Innovation Hubs?*

*Now it would not be out of step with the current 'look out not up' mantra of the Department of Health's senior leadership if apart from some brief outline of the resources available - both in terms of finance, knowledge and relationships, they left SHAs and their PCTs and Trusts to get on with it. Whether the Department gives detailed or outline guidance, this question remains; What does each SHA and their local NHS partners want to do? What should they do to make a sustainable and positive difference? What evidence or experience is there to draw from?*