Using a Design Approach to Assist Large-Scale Organizational Change

"10 High Impact Changes" to Improve the National Health Service in England

Helen Bevan

NHS Institute for Innovation and Improvement

Glenn Robert
Paul Bate

University College London

Lynne Maher
Julie Wells

NHS Institute for Innovation and Improvement

A team of practitioners, university researchers, and health care policy makers has been working to develop and apply "design sciences" thinking within the challenging context of a national system aiming to bring about a "revolution in health care." As members of that team, the authors share that thinking and early findings with those interested in the concept, theory, and practice of design as an approach to large-scale organizational change. The article builds on what to date has been a somewhat abstract debate around the design sciences, its aim being to forge stronger links between the concept and the practice of design. Using empirical data from the English National Health Service as a case study, the article seeks to demonstrate how design sciences may first, expand our thinking around organizational theory and practice and second, offer organization development some new methods, approaches, and processes around the "doing" of large-scale change.

Keywords: *organizational change; design science; high impact; NHS; design practice*

135

CONTEXT AND AIM

The context for this article is a very large public sector organization—or rather system—that is said to be undertaking "the most ambitious, comprehensive and intentionally funded national initiative to improve healthcare quality in the world" (Leatherman & Sutherland, 2003, p. 2). This initiative involves the implementation of a central government blueprint that has as its goal the transformation of the English National Health Service (NHS): the NHS Plan (Department of Health, 2000a). The aim of the NHS "quality revolution" encapsulated in the plan is to bring about a "step change in results," making health care more accessible, effective, and safe for an entire country.[1] Although other articles in this issue focus on the use of a design-based approach at the individual or team level, here we shall be applying it to system- and organization-wide transformational change.

The Blair government was elected in the United Kingdom in 1997 with a public mandate to reform the NHS, which had provided unbroken universal health care coverage since 1948 but by the mid-1990s was widely considered to have become an ailing organization. The Department of Health launched its ambitious 10-year NHS Plan in 2000, and midway through this period it is now able to claim substantial improvements to parts of its services. Inpatient waiting lists have reached their lowest point ever, and huge gains have been made in the time to access primary care practitioners and in reducing delays in accessing emergency care (Department of Health, 2005a). Much has been achieved, yet the figures also show that much remains to be done.[2]

A significant body of "best practice" improvement evidence has been accumulated within the NHS since the launch of the plan. Much of this has been the result of a series of national improvement programs that focused on the systemwide priorities highlighted in the plan, such as the care and treatment of cancer, heart disease, mental health, and critical care patients, as well as emergency transport services and clinical systems improvement. Unfortunately (although interestingly for organization development [OD] researchers), the results show significant variation in the extent to which such best practice advice has been adopted within and across the NHS, even where the evidence for improvement is compelling. Indeed, even within particular improvement programs, there has been great variation in the extent to which similar organizations given similar training and financial and expert resources have been able to achieve and sustain changes (Ham, Kipping, & McLeod, 2003).

Part of the background to this article therefore is the commonly observed scenario of "undershoot" and variation of outcomes within planned change programs (Beckhard, 1997; Dunphy & Stace, 1988; Kanter, Stein, & Jick, 1992; Miles, 1997; Nadler, Shaw, & Walton, 1995; Taffinder, 1998) where neither the results nor initial goals are fully met (at least not consistently across the board) during implementation—summed up in that wonderful phrase of Richard Pascale (1990) that "the results of change programs are often seriously underwhelming." In essence, although change interventions, including those in the NHS, often aim at systemwide second-order change, in many cases they may result in only piecemeal, small, first-order improvements—the "implementation gap."

Recently, such undershoot has been causing something of a stir in wider total quality management and OD circles, with the suggestion that the fields are "in crisis" (Bradford & Burke, 2004), not "delivering the goods," that the "well has gone dry," that they are failing to meet the "big" challenges facing contemporary organizations, such as transformational change, disruptive innovation, information technology, and globalization.

Clearly, it was not a good time for health care reformers to be relying solely on these fields to come up with the solutions to the problem of achieving large-scale, systemwide change within the NHS. Those involved with coordinating the change process at the NHS policy level also recognized this, stating that the time had come to widen and intensify the search for "better" and more effective theories and approaches. However, what they were less clear about was precisely what these new approaches were and where they could be found. This is the background to our decision to look further afield for new models and approaches to change, a search that ultimately led us to design and the design sciences.

STUMBLING ON DESIGN

The organization that initiated and sponsored this search was the NHS Modernisation Agency (MA), a national body established under the NHS Plan to lead the program of reform and charged with providing the NHS "with a centre of excellence as to how knowledge and 'know-how' about best practice can be spread"[3] (Department of Health, 2000b, p. 8). It had become increasingly evident to those within the MA that this search needed to go beyond existing perspectives, methods,

Paul Bate holds the chair of health services management within the Medical School, University College London. A social anthropologist and organization theorist by background, Paul works with clinicians, senior managers, and staff at all levels of the NHS to help bring about major improvements in health services.

Lynne Maher is head of innovation practice, NHS Institute for Innovation and Improvement. Lynne has led a number of national change programs and has specialist expertise in the sustainability of improvement initiatives.

Julie Wells is priority program head, NHS Institute for Innovation and Improvement. Julie is a communications specialist by background, has worked on national and local NHS change initiatives, and cowrote "The 10 High Impact Changes for Service Delivery."

and approaches and the underlying theories that drove them[4] as these were not by themselves going to be sufficient to deliver the transformational changes required during the next 5 years of the 10-year reform plan (Bate, Robert, & Bevan, 2004).

Our first contact with the wider field of the design sciences and the design professions—some 3 years ago—came purely by chance: another contributor to this special issue (Bartunek) had written to a member of our team inviting him to participate in an Academy of Management symposium on design science and action research, enclosing previously published papers of two of the authors also included in this issue (Romme and van Aken). These papers were shared with the other members of the NHS team who made an instant connection with them and decided to carry out a closer investigation of the design field.

At this time, "design science" was emerging as a major theme in organizational research, and some of the American and European literatures (Boland, 2003; Boland & Collopy, 2004; Romme, 2003, 2004; Romme & Endenburg, 2006) had immediate resonance with the NHS team, not least because one of the design sciences they were offering as an exemplar of the design paradigm was medicine itself. Initial NHS interest in the concept of design was also driven by the practical reason that design science (i.e., medicine) focuses on finding a solution as opposed to analyzing a problem and is concerned with the kind of pragmatic knowledge and pragmatic experimentation that practitioners and action researchers would naturally be interested in—the idea of design as a discipline of thinking that tries to "make a difference," in this case to improving the quality of health care.

Neither was a design-based approach to change really that foreign to health care practitioners. The synthesis and application of clinical evidence, itself a similar form of research-based change, is a deeply embedded practice within health care (witness the rapid growth of the evidence-based medicine movement). Furthermore, for a mixed group like ours, the most attractive thing about the design professions, such as architecture, graphic design, civil and aeronautical engineering, and computer science and software design, is how closely research and practice are intertwined (Bartunek, 2004). We were thus drawn to the idea of design because of this close connection between research, knowledge, and practice—the notion of actionable knowledge (Romme, 2003; van Aken, 2004) or research into practice (Mohrman, Gibson, & Mohrman, 2001; Rynes, Bartunek, & Daft, 2001).

We were also struck by the designer Klaus Krippendorf's comment that the designer is a "maker of meaning" (cited in Margolin & Buchanan, 1996), which is interesting as this is precisely how Smircich and Morgan (1982) defined "leadership" many years ago, and probably how many would still choose to define it today. If we accept that leaders and designers are both meaning makers, then again, it seemed possible they may have much to learn from each other about their respective methods, concepts, and practices.

Finally, "design" appeared to offer not just a particular kind of professional activity but a comprehensive approach to problem solving and transformation:

> Design is not simply about the object or aesthetics but about a broader creative approach to defining the problem itself and then developing a process to solve it. . . . At a practical level, design offers a range of proven tools and techniques for transformation that connect organizations with

their users, encourage collective participation and reveal insights in a variety of contexts. (Cottam & Leadbeater, 2004, p. 29)

Based on the work of our university/practitioner team, the MA decided to develop and follow a systematic design process to

- try and create a "product" through a design process that would lead to breakthrough levels of improvement and large-scale change,
- distill and formulate a set of design principles that would inform future national improvement initiatives (generalizable principles or universal principles of design for service improvement, Lidwell, Holden, & Butler, 2003; see also Romme & Damen; van Aken; Plsek, Bibby, & Whitby; and others in this issue).

The overall goal of the project was to create an improvement "product" that would have particular appeal to chief executives and senior leaders of NHS hospitals and primary care organizations, thereby helping to (a) close the existing engagement gap between strategic intentions and isolated frontline initiatives and (b) create better, quicker, more sustainable change. Following the four-stage design process described in this article, the NHS MA distilled the learning and best practice advice from what had become one of the largest health care improvement efforts in the world through its work with tens of thousands of NHS clinical teams over 3 years—into 10 demonstrably successful change ideas. The project eventually led to what many would argue is the MA's lasting, most significant intervention during its 5-year existence: "The 10 High Impact Changes." The story of this intervention, having been shaped by the emerging new design paradigm (at least in health care), is the focus of our article.

FIRST STEPS: GOING BACK TO SOURCE

For the past 5 years, leading organization science (OS) and OD scholars, several of them represented in this issue, have been introducing a rich vein of design science thinking and research into the change field (Boland & Collopy, 2004; Romme, 2003), and our applied work has greatly benefited from that. However, we decided early on in our project that we were not content to hear it secondhand from others outside the design field as to how designers and design scientists supposedly thought and worked but to go and find out for ourselves. We read the work of designers like architects (Lidwell et al., 2003; Margolin & Buchanan, 1996) and asked "How do designers think?" or "How do designers see themselves as thinking?" From this wide-ranging review (Bate & Robert, in press), we identified some high-level models, such as Von Hippel's (2005) "trial-and-error cycle of product development" and his thesis on "user-centered innovation," and then began to synthesize and construct a more detailed version of our own (Figure 1). Later to become the basis of our own NHS intervention, our particular design model identified a sequence of four clusters of activities involved in the design process to which most of the design approaches we had reviewed had referred in their various ways:

1. Reflection, analysis, diagnosis, and description: looking back, knowledge harvesting—establishing and codifying what we know;

Thinking like a designer

REFLECTION, ANALYSIS, DIAGNOSIS AND DESCRIPTION

• Intelligence and information gathering

• Trying to make sense (past-present)

• What is the problem we are trying to solve?

• What are the underlying design patterns/principles? (pattern seeking)

"A *sense* of here" (Hubbard)

IMAGINATION AND VISUALIZATION

• Picturing and goal-imaging

• Clarifying the uses to which it will be put and how it will impact upon the senses

• Preliminary sketches and images

• Coming up with the design idea

"A *sense* of there"

"How do we want it to feel in the there?"

ACTION AND IMPLEMENTATION

• Doing

• Construction and action

• Trialing, testing, and modifying

MODELING, PLANNING, PROTOTYPING

Applying design patterns/principles to the task ahead

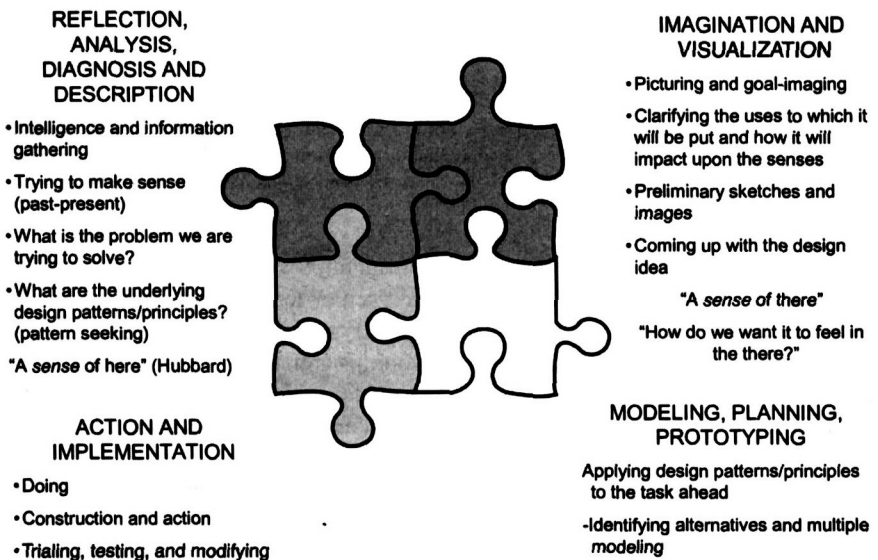-Identifying alternatives and multiple modeling

FIGURE 1:   Four Stages of Thinking Like a Designer

2. Imagination and visualization: looking forward, hypothesis formulation, imagining what may be possible;
3. Modeling, planning, and prototyping: knowledge exploitation—through prototyping and testing coming up with something that might work;
4. Action and implementation: intervention—building and testing.

We will now go on to introduce and describe each of the stages and provide some illustrations of the kinds of activity this involved in the design of the 10 High Impact Changes.

Reflection, Analysis, Diagnosis, and Description

The first stage (top left, Figure 1) represents the "understanding" or research component of the design process. Although a design approach appreciates that each system is unique, it also accepts that findings from research and past experience that are descriptive and/or explanatory in nature can still be rewritten into (preliminary) design principles for further pragmatic development and testing. This is the first stage of the design process. A design principle or pattern, as written about elsewhere in this issue (cf. Plsek et al., 2007), seeks to codify and make explicit what is in the heads of experts and practitioners so that it can be widely used by others in a range of local contexts to get improved outcomes (however these are defined); design

patterns are quite simply the solutions that according to accumulated knowledge, evidence, and experience have "worked" in the past and may therefore work or provide signposts to what might work in the future.

The lure of design principles is that they are said to be generalizable—"I use the same principles if it's a chair or an electric kettle" (Jasper Morrison, designer, as cited Margolin & Buchanan, 1996, p. 56). If similar "golden rules" or design principles exist in the social and organizational world (and why, we asked naively, should they not?), we reasoned that the discovery of these, essentially by means of a process of looking back over past successes and failures, might hold the key to successful change and improvement efforts in the future, what Peckham (as cited in Bate, 1995) called "directions for performance." After all, the NHS did have many years of intensive experience of attempting major change to look back and learn from (and had not yet done that in any systematic way). The question was how to gather, codify, and then exploit that learning in the form of some coherent and explicit design principles for future change efforts. We came to express this simple, first-stage idea of looking backward in order to see forward in a simple axiom for design: that "hindsight" gives "insight," and "insight" gives "foresight."

The questions we therefore began to ask ourselves in these early stages were

- What are the tried and tested design exemplars in the NHS and other types of organizations that are already known about and that might help in the future?
- Are there universal design principles for large-scale change in health care? If so, what are they, and what is the evidence for them?
- What are the key considerations to be borne in mind when selecting these universal principles for further investigation and testing?

The initial focus for the project was NHS Local Delivery Plans (LDPs). Local NHS organizations are required by government to produce an LDP setting out their service priorities for the next year and the means by which these will be met. An MA evaluation of the LDPs for the financial year 2004-2005 revealed that although many improvement projects were taking place across the NHS, very few of them were being translated into the mainstream priorities of the LDPs. Thus, although a multimillion-pound investment was being made in improvement initiatives across the NHS, the LDP evidence indicated that most NHS senior leaders did not regard such initiatives as relevant or contributing to the core goals of their organizations. For instance, the MA was sponsoring local improvement initiatives to redesign a range of surgical services. Yet the LDP content on how waiting time targets for patients needing surgery would be achieved, typically outlined plans for financial investment, service expansion, and stronger management of performance without any mention of the contribution of service redesign.

Based on this finding, this first "research/diagnosis" stage began with leaders from the MA asking hospital and primary care organization chief executives why they had not adopted service redesign as at least one of the ways of achieving their service priorities. The chief executives gave two specific messages. First, there were currently so many improvement initiatives covering so wide a range of illnesses and service areas that it was almost impossible for them at a strategic level to identify and select

which of these initiatives would make the greatest contribution and which therefore should be included in the operational plans. Second, even if the initiatives were prioritized, there was little data available as to the actual quantifiable difference these initiatives could make—a problem for them because they were required as part of the LDP process to make forward, "hard data" projections about what might be achieved. It generally transpired that they were more comfortable about basing planning projections on traditional, tried and tested performance techniques and approaches (making the system run more efficiently) rather than service redesign approaches, which for them represented a different way of thinking about the LDP (changing the system itself). Consequently, they made the choice to omit the latter from their projections.

A further piece of the diagnostic, "looking back" activity was to carry out an audit of all the "best practice advice for improvement" that the NHS MA was promoting. The aim was to try to see and make sense of that improvement knowledge from the point of view of the user (Bate & Robert, 2007 [this issue]; Forlizzi & Batterbee, 2004), again primarily the NHS chief executives and their hospitals and primary care organizations. The audit was revelatory: Between them, the various national program teams in the NHS were promoting more than 1,000 separate pieces of best practice advice. For instance, the national program for improvement of cancer services had synthesized its learning into five high impact principles for local cancer teams (NHS Modernisation Agency, 2003a). The "Changing Workforce" program had created guidelines for role redesign to complement service redesign activities (NHS Modernisation Agency, 2003b). Each set of best practices was the culmination of months or even years of information gathering and testing with local NHS teams. Each set was aimed at and generally well received by a specific audience of clinical professionals or specialist managers. However, for those at the strategic apex of the NHS, this pile of best practice guidelines in their entirety (and variety) was experienced as being totally overwhelming. In fact, the feedback from the chief executives was that in overall terms, this information overload had unintentionally widened the "engagement gap" between operational and strategic activities.

Our reflections at the end of this first stage were that whatever our final "improvement product" would be (and it was much too early to be precise), the following five core design requirements would need to be borne continually in mind as we worked through the other stages:

- Create high-leverage change principles: The aim should be to keep boiling things down to their simplest form so that in the end only a small number of high-leverage change principles and practices remained, these being demonstrably the ones NHS organizations needed to focus on to achieve their strategic goals.
- Do less more thoroughly: With local NHS organizations undertaking so many (often disjointed) improvement projects across different departments and units, resources were invariably spread too thinly. In addition, senior leaders were complaining of information overload. By identifying fewer priorities and not trying to do everything, NHS leaders could now focus their organizational efforts and resources on only those initiatives that were really going to make a difference.
- Quantify potential benefits: One problem was the gap between traditional NHS planning techniques for projecting strategic outcomes on the one hand and the outcome planning approaches of the national improvement programs on the other, which were often service specific and difficult to coordinate or aggregate at a strategic level. To bridge this gap, a process for identifying and

quantifying benefits that was at least as rigorous as the prevalent planning approach was needed, using hindsight to identify the benefits that teams that had implemented these changes had achieved and then applying foresight to project these potential gains across the whole NHS. So for instance, hospitals that had implemented a specific change might have reduced the length of time that each patient stays in hospital by half a day (hindsight). Projecting this across the whole NHS, if every hospital adopted this change, half a million bed days would be released (foresight).

• Design a "package" to encourage chief executive/senior leader adoption: This aspect needed to draw on the three things that are known to be critical to the spread and adoption of new practice, namely, the product itself, the kind of person expected to adopt the new practice, and the context that the person is working in (Greenhalgh, Robert, MacFarlane, Bate, & Kyriakidou, 2004). The decision was made to design a package of high impact changes specifically for the senior leadership within local health care organizations across the NHS, such as hospitals. This would not be service specific, as most of the previous national improvement programs had been, but would draw on the knowledge of the service-specific programs, at the same time being concentrated on changes that could be applied organization wide. The changes would thus be specific enough to make a real difference but generic enough to have impact in any area or service that was a priority for the organization implementing them.

• Create pull, not push: Many of the levers for changes in the 2000 NHS Plan involved push (target-led, top-down) mechanisms. Indeed from this period on, NHS organizations were to become subject to ever-stronger regulation and scrutiny and a greater range of externally driven targets and performance management regimes than ever before (Stevens, 2004). Although undoubtedly this did lead to performance improvements, it showed that externally driven change cannot on its own lead to transformational improvement (Bevan, 2005). In this context, a pull strategy, where organizations with radical ambitions adopt the changes because they want to rather than have to, seemed the most appropriate design approach. Many of the existing MA national programs were indeed based on voluntary pull principles, but the problem was that some organizations pulled and others did not, leading to a widening of the gap between the high-performing NHS organizations and the rest. The design challenge was to align the product so closely with the local senior leaders' agenda that it would be compelling to all NHS organizations and exert equal pull.

Imagination and Visualisation

The second stage of the design process (top right, Figure 1) requires the designer to begin to visualize and conceptualize what might be the ideal outcome or product or scenario for the future. This is the "mind" component of design, with its emphasis on cognition and foresight, developing the ideal or the target by "trying out in the head" various potential solutions. It is important to recognize that at this stage one can never see clearly what the end result is likely to be, and so it is important not to make the future product and shape too specific or concrete (what the architect Frank Gehry called the "liquidity" or "free play" stage, as cited in Boland, 2003). Rather, what the designer uses are "placements," different frames that position and reposition the problems or issues at hand, each emerging as a working hypothesis for the future design (Margolin & Buchanan, 1996)—witness for example the rough sketches and outlines used by artists and designers before they settle on their final composition. Designers themselves have specific methods and techniques that they use for this purpose, including scenarios and storyboards, prototyping, cognitive and video walkthroughs, dramaturgy, narrative and storytelling, many of which are very rough and ready, relying on "low-tech" tools such as cardboard and sticky tape (Bate & Robert, in press).

Most of these early rough ideas were triggered in this case by conversations with NHS senior leaders. One of the chief executives talked about his wish for a "ready

reckoner" for improvement that would specify the quantified benefits that improvement work could deliver and enable him to effortlessly calculate potential gains and forward plan. This picture was consistent with a strong theme in the early design phase of our work, with senior NHS leaders telling us that they wanted to utilize service redesign approaches and could see where their potential lay but saying that this would never happen unless and until such approaches were framed in the existing language and methods of NHS planning. Therefore, the early vision that began to form was for a "radical breakthrough" product that felt mainstream and familiar to its intended leadership audience. A further step in the design team's thinking was the idea that this product should be the NHS equivalent of (U.S. television host) David Letterman's "Top 10 List" for improvement in health care. This would require the MA to stand in the shoes of the leadership community and identify a small and finite number of high-leverage principles for change and improvement. And so it was that all these conversations and ideas began to coalesce around the idea of "10 High Impact Changes."

Modeling, Planning, and Prototyping

The third stage of the design process (bottom right, Figure 1) is to begin to prototype a model that will deliver the kind of product envisioned, using the previously identified design principles as the guide for "what will work." At this stage, the prototypes are kept as simple as possible by stripping away all nonessential aspects. In essence, we all need such a model to navigate through complex, large-scale situations, especially busy practitioners. This is what a model is: a map, a representation, and to some extent, idealization of reality.

To create the "Top 10 List," the 1,000 and more pieces of best practice advice had to be whittled down to a small number of high impact changes. A set of evaluative selection criteria was developed for this purpose. Examples included the potential to impact on large numbers of patients, a focus in areas where there was a significant gap between typical NHS practice and best NHS practice, scope for NHS organizations to interpret and translate the changes for the local context, and relative ease in implementation.

The MA team used criteria like these to reduce the list to the 64 "best practice changes with the greatest potential." These 64 changes were then taken to a participatory design day with an expert panel of 40 people comprising national leaders from across the whole range of MA programs, plus a number of local NHS leaders of improvement. All the members of the panel were skilled and experienced in the science and practice of health care improvement. The panel worked through a systematic process to identify and agree on the 10 highest impact changes on the list, plus 2 reserve changes in case the team later ran into difficulties with any of the original 10. The eventual output of this process was the "10 High Impact Changes for Service Improvement and Delivery" (NHS Modernisation Agency, 2004) as shown in Table 1.

The next phase in the design process, again mirroring the way people like architects and software design engineers work, was to carry out an initial proof of concept

TABLE 1
The 10 High Impact Changes

1. Treat day surgery (rather than inpatient surgery) as the norm for elective surgery
2. Improve patient flow across the whole National Health Service system by improving access to key diagnostic tests
3. Manage variation in patient discharge, thereby reducing length of stay
4. Manage variation in the patient admission process
5. Avoid unnecessary follow-ups for patients and provide necessary follow-ups in the right care setting
6. Increase the reliability of performing therapeutic interventions through a care bundle approach
7. Apply a systematic approach to care for people with long-term conditions
8. Improve patient access by reducing the number of queues
9. Optimize patient flow through service bottlenecks using process templates
10. Redesign and extend roles in line with efficient patient pathways to attract and retain an effective workforce

Source: National Health Service Modernisation Agency (2004).

exercise. The team wanted to ensure that it had picked the "right" changes, that the data would be available to create the requested "ready reckoner," that the concept of 10 High Impact Changes would actually work, and that it would "hit the spot" with the NHS leadership community. Of the 10 Changes, 2 were selected and, again following broader design practices, prototyped to a high level of specification ("high fidelity prototypes"). For each of the 2 prototype changes, the case for change was established empirically through known evidence, the potential benefits identified, and illustrative NHS case studies written. The changes were then "road tested" with the intended audience of chief executives. Many amendments were subsequently made to the format and focus of the changes as a result of the prototyping and testing, by the end of which the team believed there had been proof of concept and that they had arrived at a product that would work.

During the next 8 months, 10 High Impact Changes for Service Improvement and Delivery (the "improvement product") was fully developed. A subject-expert champion was identified to lead the development of each of the 10 changes. These 10 individuals were mostly NHS clinicians with deep subject knowledge at the expert/ evidence level and a specialist interest in the topic. An accompanying justification was developed for each of the changes. The process for implementing the change was also described, together with an assessment of the costs associated with implementation. Finally, a statement was made as to the likely impact of implementing the change across the NHS. For instance, an increase in day case surgery (High Impact Change 1) was estimated on available best evidence to release half a million unnecessary bed days each year. Improving access to key diagnostic tests (2) could save 25 million weeks of unnecessary patient waiting time across the NHS, and the use of process templates (9) could free up 15% to 20% of current capacity.

The 10 High Impact Changes were finally launched in September 2004, 15 months after the initial design process had commenced. Every stage of the design and development process we had worked through had been challenging as nothing like this had ever been attempted in the NHS previously, either in terms of the process or the bold ambition and scale of the project.

Action and Implementation

Although all three stages of the design process had made a significant contribution to the conception and development of the 10 High Impact Changes, it was the fourth and final stage of the design approach—action and implementation (bottom right, Figure 1)—that determined whether they would actually have any real impact. It was here that serendipity, which the design process could not have envisaged, came to our aid. At the same time that the 10 High Impact Changes were being conceived, the government had embarked on an efficiency review. Every department of government was required to put forward a plan as to how efficiency savings would be made. Even at proof of concept phase, the High Impact Changes program was suggesting potential savings of millions of unnecessary appointments in hospitals and primary care, millions of unnecessary bed days, and millions of wasted hours for clinicians. Not surprisingly, the decision was made at a senior policy level to make the High Impact Changes one of the main leverage components in the Department of Health's response to the efficiency review. The project thus changed from being a relatively low-key pull initiative to a center-stage national program with both push and pull components. For instance, the guidance issued by the Department of Health to support the next round of Local Delivery Planning specified that the 10 High Impact Changes must be included in every LDP. In a period of 18 months, the scenario thus changed from one where service redesign components featured in only a tiny minority of LDPs to one where it featured in every LDP in the country. The design process could not have counted on the eventuality of the efficiency review. Nevertheless, the fact that the design approach was taken up at this level led to a product that, although running the risk of being reincorporated into the traditional top-down model, ended up meeting the need of the mainstream performance improvement agenda more closely—and arguably was all the more credible and influential for that.

The 10 High Impact Changes were launched by the NHS chief executive at a conference for senior NHS leaders. At that meeting, 1,500 copies of the guidance were distributed. In the first year, more than 20,000 hard copies of the guidance were distributed within the NHS, and there were more than one million hits to the Web site ("Ten Ways to Shake the World," 2004). In November 2004, the directors of service improvement of every Strategic Health Authority in the NHS collectively adopted the High Impact Changes as a key plank in their local improvement strategies and began work with the MA to create a common set of measures that all NHS organizations could use to track progress in implementing the changes.

In early 2005, KPMG Consultants carried out an independent audit of the government's Department of Health efficiency review proposals. In their report they described the 10 High Impact Chances as *well designed* (our emphasis), well evidenced, and inherently measurable. KPMG estimated that the changes were capable of delivering £1 billion worth of savings (Department of Health, 2005b). In October 2005, the 10 High Impact Changes won the prize for the best productivity improvement program in the British public sector. This was awarded by the Office of Government Commerce, a national government body that oversees and champions public sector change.

Further research since then has shown that the High Impact Changes have fundamentally changed the paradigm of best practice advice in the NHS and helped to close the engagement gap between the strategic imperatives of NHS leaders and local improvement projects (Cornwell, 2005; Middleton-Kelly & Bevan, 2006). Strategically focused improvement advice has become much more the norm. For the first time, potential improvement benefits have been calculated cumulatively across a whole country, and to this extent, foresight has been taken to a new level.

There has not been any quantitative study of the impact of the 10 High Impact Changes, and as ever, even if there had it would still be very difficult to assess which performance improvements are due to the Changes and which have resulted from other contemporaneous initiatives. However, since the launch, the NHS has made significant progress in the key indicators of improvement set out in the 10 High Impact Changes. For instance, day case rates have increased, and patient waits and length of stay have reduced. High Impact Changes have been subsequently developed and spread to mental health and general practice (primary care services). Many claims have also been made locally of big improvements that have supposedly resulted from the High Impact Changes. In one hospital for example, Changes 3 and 4 have been used to ensure that beds are available for patients with acute mental health needs, with estimated savings of around £1 million per year. At another hospital, length of stay for orthopedic patients has reduced from 9 to 4 days. In one health area, Change 5 has been implemented, and there have been more than 6,000 fewer outpatient "follow-up" attendances. At the other end of the scale, the Changes have been said to have had a global impact in shaping the thinking and practices of countries grappling with similar health care challenges, such as Australia and the United States.

DISCUSSION AND CONCLUSIONS

We would forward three explanations as to why the initiative seems to have had the impact that it has and why it has received such a positive response, especially from the users themselves.

First, the 10 High Impact Changes have enabled senior leaders to apply radical improvement thinking to their mainstream goals, providing them with the necessary evidence and reassurance to "take the plunge." Design principles (also see Plsek et al., 2007) such as those identified by the MA for this large-scale change effort essentially codify reusable design expertise in ways that provide time-proven solutions to commonly occurring problems. Such design principles have been described as "a named nugget of insight that conveys the essence of a proven solution to a recurring problem within a certain context" (Appleton, 2000, p. 4). Principles represent distilled experience that through its assimilation conveys expert insight and knowledge to inexpert developers. The use of such well-established, tried and tested—and to this extent evidence-based—design principles thereby increase the probability that a design will be successful, at the same time giving practitioners what they have always sought (and not always received) from OD, namely, broad-based solutions that are said to work.

Second, senior leaders in the NHS and the Department of Health quickly embraced the principles when they recognized the contribution they could make to the mainstream performance improvement agenda. *Radical* often implies challenging and opposing the "conventional," but in this case, the two found a way of working together, the first through the cover and credibility provided by the second and the second through the unaccustomed levels of engagement created by the first. The Changes also succeeded in engaging both clinicians and managers; the former because of their emphasis on evidence and best clinical practice and the latter because of their obvious relevance to performance and efficiency concerns. In short, their "motivational relevance" to both professional groups was high. At the same time, they offered them "actionable knowledge," knowledge in the direct service of action, knowledge that they could recognize as "sensible" (but possibly previously had not been able to codify or articulate) and could actually do something with. Clearly the paradigm of pragmatism that underlies the design sciences approach holds much appeal for those in "solution" mode, whether this be for the health of the organization or the health of a patient.

Finally, and perhaps most important, the design process underpinning the 10 High Impact Changes leads us to conclude that as in other fields like architecture and computing, it is indeed possible to formulate high-level universal principles that can be tailored and adapted to a wide variety of local contexts by those directly involved in their implementation (the "universal but variable" thesis enunciated in a number of social science disciplines, i.e., Kempen, 1996; Kluckhorn & Strodtbeck, 1961; Parker, 1957; and as applied previously to OD and OS, Bate, 1984). So although central agencies (e.g., the MA) can bring value in providing the broad design principles, it is left to frontline practitioners to implement changes as they see fit and in ways that they decide, such local ownership and choice being a vital element in encouraging the various levels of a large and highly pluralistic system like the NHS to work in a reasonably coordinated yet self-managing and semiautonomous manner.

However, some aspects of the implementation of the 10 High Impact Changes are less positive (Cornwell, 2005), and hindsight has revealed a number of shortcomings in the design approach as applied in this case study that need to be addressed. First, the challenge of variation remains. Some NHS organizations have embraced the Changes wholesale within their strategic programs and are systematically implementing them across the board with good reported outcomes (Middleton-Kelly & Bevan, 2006). Other organizations, although expressing a commitment to the Changes, have actually done very little with them. So, however good the design concept (and our evidence postimplementation does strongly suggest a "good" design), it therefore remains dependent on effective leaders to enable the design to become active reality. Clearly, work needs to be done on the ways leadership processes and design processes might be brought together more effectively within the broader kind of OD process described. We need greater clarity on what it is to lead a design process as opposed to a change process.

Second, greater segmentation was needed in terms of differentiating between various target audiences. The design process sought to "stand in the shoes" of its main target audience, the chief executive community. However, other groups such as

clinical leaders and frontline clinical teams also needed to be targeted if the full potential of 10 High Impact Changes was to be delivered. These groups should have been considered at the start and invited to play a stronger coproduction role in the design process. Subsequent to the publication of the 10 High Impact Changes, targeted versions were developed. These included 10 High Impact Changes for Clinicians, 10 High Impact Changes for NHS Boards, and 10 High Impact Changes for Primary Care Trusts (the organizations that commission hospital and community services on behalf of patients). However, this was not nearly enough, and it came too late. For instance, the Changes offered the potential of millions of pounds of savings, yet many of the finance directors in NHS organizations failed to make any connection with them. In hindsight, a group of finance leaders should have been invited at the modeling, prototyping, and planning stage to coproduce a product that framed the Changes from their perspective and in line with their priorities.

Third, one of the greatest challenges was how to identify and create future projections of likely benefits arising from the Changes. In the past, local teams had not collected outcome data in ways that made any kind of national assessment and quantification easy. Different local teams that had previously implemented the specific changes had often measured the outcomes in different ways. In addition, some of the High Impact Change champions were nervous about specifying the potential gains across the whole country, fearing that such aspirations might come to be viewed as another national target.

Finally, although field testing took place at initial proof of concept stage, it was not followed up with further NHS field testing of the complete product. Such testing would have led to a product that more closely met the needs of its target audiences. Nonetheless, ongoing reflections on the design methodology of the 10 High Impact Changes has contributed to the development of a standardized work process methodology for the NHS Modernisation Agency and its successor body, the NHS Institute for Innovation and Improvement. In that sense, the design process that led to the 10 High Impact Changes should not be viewed as a one-off exercise resulting in an improvement product but as a continuous process of development in which mistakes and omissions are not only unavoidable but arguably from a learning point of view a positive feature. So for instance, field testing of the complete product (postprototype phase) is now an integral part of the new Institute's work process methodology.

We need to acknowledge that design thinking as an OD intervention is still at an infant stage (Bate & Robert, 2007). However, we believe the 10 High Impact Changes experiment demonstrates considerable learning and promise. It is too early to specify whether the product has led to breakthrough levels of improvement and large-scale change. However, it has had more or as much national impact on leadership mindset and the narrowing of the "engagement gap" as any previous MA program. It has triggered a leap forward in the use of systematic design methodologies in the NHS. In addition to the evolving work process methodology, a "vision to delivery" accelerator is being designed by the NHS Institute to enable all NHS organizations to apply a systematic design approach to service innovation (NHS Institute, 2005). Design principles have been distilled and continue to be distilled as a result of the formative learning from the 10 High Impact Changes, and to this extent it may be said that "design thinking" has

become integral to the way many people approach the task of change and service improvement within the NHS.

NOTES

1. As a case study of a complex, large-scale organizational change at the beginning of the 21st century, the National Health Service (NHS) in England has few, if any, equals. The NHS is one of the largest organizations in the world, with approximately 1.3 million staff and an annual turnover of £74 billion. It provides health care for the citizens of England on the basis of need rather than ability to pay. Its activities are largely funded through direct taxation. To give a feel of this scale, in a given year in the NHS, 325 million consultations were held with primary care (ambulatory care) physicians or nurses in primary care, 13.3 million people attended a first out-patient appointment with a hospital specialist, nearly 13.9 million people attended accident and emergency departments, and there were 4.2 million emergency admissions. In total, more than 5.4 million people were admitted to hospital for patient treatment (Department of Health, 2004). In short, the NHS is big and very busy.

2. Performance improvement does not stand still. Each year, NHS organizations are required to achieve shorter waiting times, better clinical quality, greater patient-centeredness, and higher levels of efficiency and productivity (Department of Health, 2006). Despite overall performance improvement, there is still significant variation in the system. For instance, the number of patients admitted per special-ist doctor is twice as high in some hospitals as others. patients are brought back for follow-up visits four times as often in some hospitals as others. on average, patients stay in hospital for three times as long in some hospitals compared to others (NHS Institute for Innovation and Improvement, 2006). The patient death rate is nearly twice as high in some hospitals compared to others. There is a twofold variation in unexpected patient readmissions and a threefold variation in the incidence of hospital-acquired infections.

3. The period since the publication of the NHS Plan has seen a variety of government strategies to lever improvement in the NHS system. These range from setting national standards and targets for per-formance, to inspection against these standards, to publishing comparative performance information, to opening up the NHS to care providers from the private and voluntary sectors, thereby giving patients more choice and control over their NHS care (Stevens, 2004). All of these interventions are based on "theories of action" (Argyris, 1993) about the changes that will have the greatest impact on NHS performance. These include management theory about planned programmatic change, theories about making compar-ative clinical performance data more transparent from the field of quality assurance, and market economic theory about the positive role of new entrants to a market. However, the underpinning theories are rarely made explicit or tested extensively as hypothesis for change.

4. The NHS Modernisation Agency was part of the English Department of Health. It existed between 2001 and 2005. At its height, it employed 750 staff and coordinated nearly 100 national programs in ser-vice redesign, clinical quality improvement, workforce reform, and leadership development. It held a bud-get of £200 million per annum, most of which was distributed to local NHS organizations who were charged with making change happen (NHS Modernisation Agency, 2004).

REFERENCES

Appleton, B. (2000). *Patterns and software: Essential concepts and terminology*. Retrieved June 13, 2006, from http://www.cmcrossroads.com/bradapp/docs/patterns-intro.html

Argyris, C. (1993). *Knowledge for action*. San Francisco: Jossey-Bass.

Bartunek, J. M. (Chair). (2004, August). *Is design science better at creating actionable research and knowledge than action research is?* Symposium conducted at the Annual Meeting of the Academy of Management, New Orleans, LA.

Bate, S. P. (1984). The impact of organizational culture on approaches to organizational problem-solving. *Organization Studies, 5*, 43-66.

Bate, S. P. (1995). *Strategies for cultural change*. Newton, MA: Butterworth-Heinemann.

Bate, S. P., & Robert, G. (2007). Towards more user-centric OD: Lessons from the field of experience-based design and a case study. *The Journal of Applied Behavioral Science, 43,* 41-66.

Bate, S. P., & Robert, G. (in press). *Bringing the user experience to healthcare: Concepts, methods and practices of "experience-based" design.* Oxford, UK: Radcliffe Publishing.

Bate, S. P., Robert, G., & Bevan, H. (2004). The next phase of health care improvement: What can we learn from social movements? *Quality and Safety in Health Care, 13*(1), 62-66.

Beckhard, R. (1997). *Agent of change: My life, my practice.* San Francisco: Jossey-Bass.

Bevan, H. (2005). *On the challenges of reform.* Retrieved June 13, 2006, from http://www.institute.nhs.uk

Boland, R. (2003). *Managing as designing* [Video]. Retrieved June 13, 2006, from http://nextd.org/02/08/01/index.html

Boland, R., & Collopy, F. (Eds.). (2004). *Managing as designing.* Palo Alto, CA: Stanford University Press.

Bradford, D. L., & Burke, W. W. (2004). Introduction: Is OD in crisis? *The Journal of Applied Behavioral Science, 40,* 369-373.

Cornwell, J. (2005). *Implementation of the 10 High Impact Changes* (Report for the NHS Modernisation Agency). Unpublished manuscript.

Cottam, H., & Leadbeater, C. (2004). *RED Report 01. Health: Co-creating services.* London: Design Council.

Department of Health. (2000a). *The NHS Plan: A plan for investment, a plan for reform.* London: The Stationery Office.

Department of Health. (2000b) *The NHS Plan—Implementing the performance improvement agenda* (A policy position statement and consultation document). London: The Stationary Office.

Department of Health. (2004). *Chief executive's report to the NHS: May 2004.* London: The Stationery Office.

Department of Health. (2005a). *Chief executive's report to the NHS: December 2005.* London: The Stationery Office.

Department of Health. (2005b). *Productive time review: The 10 High Impact Changes* (Report to the Efficiency Board). Unpublished manuscript.

Department of Health. (2006). *The operating framework for 2006/7.* London: The Stationery Office.

Dunphy, D. C., & Stace, D. A. (1988). Transformational and coercive strategies for planned organizational change: Beyond the OD model. *Organization Studies, 9,* 317-334.

Forlizzi, J., & Batterbee, K. (2004). Aesthetics, ephemerality and experience: Understanding experience in interactive systems. In *Proceedings of the 2004 conference on designing interactive systems: Processes, practices, methods and techniques* (pp. 261-268). Cambridge, MA: ACM Press.

Greenhalgh, T., Robert, G., MacFarlane, F., Bate, S. P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *Milbank Quarterly, 82,* 581-629.

Ham, C., Kipping, R., & McLeod, H. (2003). Redesigning work processes in health care: Lessons from the National Health Service. *Milbank Quarterly, 81,* 415-439.

Kanter, R. M., Stein, B. A., & Jick, T. D. (1992). *The challenge of organizational change: How people experience it and manage it.* New York: Free Press.

Kempen, H. J. G. (1996). Mind as body moving in space. Bringing the body back into self-psychology. *Theory and Psychology, 6,* 715-731.

Kluckhorn, F. R., & Strodtbeck, F. L. (1961). *Variations in value orientations.* New York: Row, Peterson.

Leatherman, S., & Sutherland, K. (2003). *The quest for quality in the NHS: A mid term review of the ten year quality agenda.* London: Nuffield Trust.

Lidwell, W., Holden, K., & Butler, J. (2003). *Principles of design, 100 ways to enhance usability, influence perception, increase appeal, and make better design decisions.* Gloucester, MA: Rockport.

Margolin, V., & Buchanan, R. (Eds.). (1996). *The idea of design.* Cambridge, MA: MIT Press.

Middleton-Kelly, E., & Bevan, H. (2006). *Transferring the learning from two NHS hospitals using a complexity approach.* Unpublished manuscript.

Miles, R. H. (1997). *Leading corporate transformation.* San Francisco: Jossey-Bass.

Mohrman, S. A., Gibson, C. B., & Mohrman, A. M. (2001). Doing research that is useful to practice: A model and empirical exploration. *Academy of Management Journal, 44,* 357-375.

Nadler, D. A., Shaw, R. B., & Walton, A. E. (1995). *Discontinuous change. Leading organizational trans-formation*. San Francisco: Jossey-Bass.

National Health Service Institute for Innovation and Improvement. (2005). *Focus on quality and value*. Retrieved June 13, 2006, from http://www.institute.nhs.uk

National Health Service Institute for Innovation and Improvement. (2006). *Focus on productivity and efficiency*. Retrieved June 13, 2006, from http://www.institute.nhs.uk

National Health Service Modernisation Agency. (2003a). *The cancer services collaborative improvement partnership, high impact changes for cancer services*. Leicester, UK: Author.

National Health Service Modernisation Agency. (2003b). *Changing workforce programme*. Leicester, UK: Author.

National Health Service Modernisation Agency. (2004). *10 High Impact Changes for Service Improvement and Delivery: A guide for NHS leaders*. London: The Stationery Office.

Parker, deWitt H. (1957). *The philosophy of value*. Ann Arbor: University of Michigan Press.

Pascale, R. T. (1990). *Managing on the edge. Companies that use conflict to stay ahead*. New York: Simon & Schuster.

Plsek, P., Bibby, J., & Whitby, E. (2007). Practical methods for extracting explicit design rules grounded in the experience of organizational managers. *The Journal of Applied Behavioral Science, 43*, 153-170.

Romme, A. G. L. (2003). Making a difference: Organization as design. *Organization Science, 14*, 558-573.

Romme, A. G. L. (2004, August). The relevance gap: Action and design research. In J. M. Bartunek (Chair), *Is design science better at creating actionable knowledge than action research is?* Symposium conducted at the annual meeting of the Academy of Management, New Orleans, LA.

Romme, A. G. L., & Damen, I. C. M. (2007). Towards science-based design in organization development: Codifying the process. *The Journal of Applied Behavioral Science, 43*, 108-121.

Romme, A. G. L., & Endenburg, G. (2006). Construction principles and design rules in the case of circular design. *Organization Science, 17*, 287-297.

Rynes, S. L., Bartunek, J. M., & Daft, R. L. (2001). Across the great divide: Knowledge creation and transfer between practitioners and academics. *Academy of Management Journal, 44*, 340-355.

Smircich, L., & Morgan, G. (1982). Leadership: The management of meaning. *Journal of Applied Behavioral Science, 18*, 257-263.

Stevens, S. (2004). Reform strategies for the English NHS. *Health Affairs, 23*(3), 37-44.

Taffinder, P. (1998). *Big change. A route-map for corporate transformation*. Chichester, UK: Wiley.

Ten ways to shake the world. (2004, September 9). *Health Service Journal* (Suppl.).

van Aken, J. E. (2004). Management research based on the paradigm of the design sciences: The quest for tested and grounded technological rules. *Journal of Management Sciences, 41*, 219-246.

van Aken, J. E. (2007). Design science and organization development interventions: Aligning business and humanistic values. *The Journal of Applied Behavioral Science, 43*, 67-88.

Von Hippel, E. (2005). *Democratizing innovation*. Cambridge, MA: MIT Press.