**Response to NHS Chief Executive’s Open Call for Evidence and Ideas**

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<th>Respondent ID:</th>
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<td>Organisation name:</td>
<td>NHS East Midlands</td>
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<td>Type of response:</td>
<td>Document and supporting literature</td>
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### Hypotheses/dilemmas:
- Adoption of innovations and innovative practice in the NHS is frustratingly optional. Innovators can find it hard to shift the weight of inertia in order to change the status quo.
- Professional groups desire autonomy in what and how they innovate.
- There is high variation in the provision of innovative healthcare for the same population, depending on which provider is accessed. ‘The future is already here....its just not evenly distributed’ William Gibson in Frank M and Moore G.
- Globalisation of standards and customer experience to ensure market leadership is evident in the service industry but less so in healthcare standards.
- The potential for the NHS to be more cost-effective/productive is constrained by lack of take up of lean approaches and technologies which assist a ‘right first time’ approach.
- There is light touch regulation and assessment of the take-up and implementation of evidence-based or ‘obvious’ leading edge innovations that would improve care.
- There is continual reinvestment in reinventing the innovation wheel and this will continue, with the associated costs incurred, unless there is a radical change in the adoption mindset in the NHS.
- The general public is generally ill informed about the options for their healthcare episodes and what leading edge technologies can be expected to be used.

### Action Summary

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### Question:
Learning from elsewhere about adoption and spread -
What can the NHS and NHS Commissioning Board learn from local, national and international best practice to accelerate the pace and scale of adoption of innovations in the NHS?

What actions at national level in the NHS - specific actions do you think national NHS bodies, such as the NHS National Commissioning
**Board, need to take to encourage and stimulate the successful and rapid adoption and spread of innovations throughout the NHS?**

**Actions at local level in the NHS - What specific actions do you think local NHS bodies, such as providers and Clinical Commissioning Groups, need to take to encourage and stimulate the successful and rapid adoption and spread of innovations throughout the NHS?**

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<th>1.1 Use Competitive Advantage between organisations as a driver for standardisation to the highest (leading edge) practice:</th>
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<td>From industry, the NHS can learn from the concept of competitive advantage i.e how firms constantly strive to create and maintain competitive advantage to ensure organisational success, higher customer satisfaction and market share.</td>
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<td>Whilst price competition is absent in the NHS, the push for Foundation Status as the minimum norm creates a huge opportunity for the FT process and Monitor to play an increased role in including adoption of innovative, leading edge practice, products and approaches as part of their assessment processes.</td>
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<td>At the same time, Clinical Commissioning Groups could also be required to evidence commissioning of take up of innovations or outcomes which have a lower length of stay than at present, the lower figure being equal to the top centile of organisations for particular activities and which would be delivered if the specific leading edge innovations were employed.</td>
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<th>1.2 Motivate a movement for change by highlighting the opportunity for Relative Advantage</th>
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<td>• Highlight the size of the quality gap between patient experience, outcomes and productivity of the NHS at present as compared to what we could achieve. Use a clear and convincing overarching patient and clinical narrative to achieve this. Use the language of missed opportunities for patients. Consider the concept of the Relative advantage for patients that we would achieve if a, b and c were adopted.</td>
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<td>• Les Robinson says: ‘Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes by a particular group of users, measured in terms that matter to those users, like economic advantage, social</td>
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| 1.1 (i) There is a huge opportunity for the FT process and Monitor to play an increased role in realising increased adoption of innovative, leading edge practice, products and approaches as part of their assessment and approval processes. |
| 1.1 (ii) Approval process or subsequent accreditation of CCGs to include review of how outcomes are commissioned for, as compared to the top centile of organisations. |

| 1.2 (i) NHS National Commissioning Board, CCGs and agencies to frame relative advantage of using leading edge approaches. |
| (ii) NHS National Commissioning Board, CCGs and agencies to tweak the language used to motivate NHS staff and their partners to think in a win-win way of achieving optimum outcomes for patients using innovations and speeding up the rate of middle and late stage technology adoption. |
prestige, convenience, or satisfaction. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely to be. There are no absolute rules for what constitutes “relative advantage”.

- Reinvention is a key principle in Diffusion of Innovations. The success of an innovation depends on how well it evolves to meet the needs of more and more demanding and risk-averse individuals in a population (the history of the mobile phone is a perfect example).

- A good way to achieve this is to make users into partners in a continuous process of redevelopment. Computer games companies, pharmaceutical corporations and rural research institutes are examples of organisations that seek to make users active partners in improving innovations by supporting user communities or by applying participative action research techniques.

As a response to this, is there a way other than new SBRI s for manufacturers to co-operate with the NHS to invest in re-invention of products and other technologies that currently partially meet need but not quite.

1.3 NHS pathways are similar to industrial and retail value chains, with value added by many organisations at different parts of the pathway.

‘Adoption rates of products in Cloud IT technologies are extraordinary ‘ ...such as the iPad. and Google’s Android phone which has achieved 16% market share in one year. This, when applied to building the NHS equivalent of ‘Enterprise 2.0’ means enabling patients, the population and consumers of care to connect up by disaggregating the commissioning of ‘end to end value chains and moving instead to networked collaboration’.

(iii) NHS National Commissioning Board to consider ways for co-operation between the NHS and industry to reengineer existing products to become more refined and more precisely meet the needs of the NHS. This is as opposed to inventing from new as happens with SBRI and can take 2-4 years for those products to come to market.

An innovation technologies investment fund similar to the National Innovation Fund concept could be used to ensure that there is a continual pipeline of products being refined which meet the needs of the entire NHS at the same time. Currently this operates at local level only.

1.3 (i) Engage patients as collaborators in forcing the adoption of innovations as part of specific technology adoption and service standards.

1.3 (ii) Engage patients in collaborative innovation – via IT systems and by tapping into the energy invested by the population in social networks (the millennial mindset) and engage the millennial generation with healthcare issues and concerns. This will serve to increase the focus on the the ‘overall architecture of work’ rather than the optimisation of component processes.

1.3 (iii) The NHS Commissioning Board (possibly sub-contracting work on each of these to Clinical
1.4 The limitations of a universal mandate to adopt innovations and how to minimise the barriers to this

- ‘Despite sincere attempts in recent years to spread innovation through the mass dissemination of knowledge and expertise’….‘our experience with the spread of innovation in health care often seems to have more in common with the occasional pleasant and unpleasant frustration associated with raising children’….and healthcare complexity ‘affects the generation and spread of process innovations’ Plsek P.

- ‘Patterns of relationships, beliefs, power, conflict are as much a part of the system as are the structures and processes’ Plsek, P

- Deliberately surfacing and changing underlying simple rules leads directly to innovative ideas, Plsek P.

- Small changes can have a big impact, are non-linear, ‘often found in simple rules’ Plsek P

Commissioning Groups) could consider the pathway for the top 15-20 areas of cost and volume to determine what key ‘moments of engagement’ are most likely to be significantly impacted by known innovative products, approaches and technologies and commission for these.

1.3 (iv) Move to a clear quality standard of a high quality, leading-edge and innovative NHS, a parallel to the Apple equivalent of ‘Designed by Apple in California’ which ‘creates unique value through superior design and customer experience’. The NICE 150 quality standards will form the core of this, but will it be wide enough in scope and will they be delivered soon enough to realise QIPP?

1.4 (i) NHS Commissioning Board to recognise the power of different professional groups in visibly recognising the value of certain innovations and innovative ways of working and devise strategies to maximise the leverage these will have to robustly encourage implementation of innovations and challenge the status quo.

1.4 (ii) NHS Commissioning Board to or commission others such as iTAPP to….set out a campaign plan for the national adoption of specific technologies, on the basis of adoption of these being accepted as leading to high levels of care.

1.4 (iii) National Commissioning Board to identify key clinical opinion leaders to own and spearhead the
| 'A decision to change is ultimately made by the individuals in a complex system according to personal mental models...as the benefits and risks associated with the change’ Plsek P. |
| Change is not so much about overcoming resistance as it is about understanding and working with natural attractor patterns in the system, Plsek P and Kilo 1999....Think of the spread of ideas as the result of an individual or group decision adoption process’ Plsek P, and use Rogers (1995) theory of the power of opinion leaders in effecting adoption. |
| Avoid Coercion, Plsek P |
| Need to create a specific language around the innovation and the organisational context needs to be receptive to change. Plsek P. |
| ‘Engage the natural creativity of the entire healthcare workforce and build a receptive organisational context for change’ Plsek P. |
| ‘Social networking in health care organisations’ is ‘essential to the goal of spread of innovation’ Plsek P |
| The Royal Colleges could have an increased role in influencing members to visibly adopt innovations, thereby improving outcomes. |
| The National Commissioning Board could commission work on the pathways and outcomes for the top 15-20 areas of cost and volume to determine what key ‘moments of engagement’ are most likely to be significantly impacted by known innovative products. |
| acceptability of the innovation changes. |
| 1.4 (iv) National Commissioning Board to create a new language and framing around the innovative culture which is owned and recognised by clinicians and key opinion leaders. |
1.5 Need for a ‘top down’ approach, directly from the DoH (iTAPP) to Senior Trust Management for technology adoption.

- In retrospect, if this support was clear at the outset, including via the Director of Finance route, it would have added much more weight to the call to spread innovative technologies and provided more direction to Trusts. This approach would have ensured an earlier and more positive opening of minds and doors to the project teams (SHA/NTAC etc.), thereby delivering greater adoption/results, over a much shorter period of time. At the current time, this is to all intents and purposes optional.

- There is no ‘one size fits all’ approach in respect of the actual products, so unless a product could be used by all the Trusts, was cost effective, delivered high levels of benefits to patients/NHS, was simple to implement etc., adoption is always going to be down to each Trust’s current status in respect of the product, clinical area, benefits, priority status etc.

  ➢ There are other barriers that we have to overcome, such as:
  ➢ Existing products already purchased and being operated within the Trust
  ➢ Existing contracts with providers on products
  ➢ Capital available to the Trust if a product is expensive
  ➢ Clinician preference for other products
  ➢ Clinician preference for other types of treatment methods
  ➢ Gathering trial data/findings/evidence in support any product, within the NHS and UK – this is not always available if a product is new to this market.
  ➢ A product may require other ‘supporting’ changes to be made, in order to fully utilise the product and benefits.

- Although the ITAPP list was made up of a wide variety of products, there were many manufacturer’s of other or similar products, that for whatever reason did not apply to be included on the ITAPP list. From a procurement point of view, and to avoid any challenge, the NHS cannot afford to ignore other manufacturer’s products, which have a product/results similarity.

1.5 (i) NHS National Commissioning Board to set a clear mandate from NHS CE for technology adoption as part of delivering a leading edge, productive NHS.

1.5 (ii) in iTAPP, is there a place for more generic or technology bundled approach to innovation product adoption instead of or as well as specific products only.
The availability of the products on the iTAPP list differ greatly in respective of ‘procurement routes’ – some may already be available to Trusts through NHS Supply Chain or other framework agreements, but many could require a procurement process to take place, prior to the product being purchased. As well as this, all PCT/Trust procurement policies have to be taken into account. If a full process has to be carried out, this can add many months to any adoption/implementation.

References:

- Plsek P, Complexity and the adoption of Innovation in Health Care, National Committee for Quality Health Care, 2003
- Ganz M, Professor, Harvard Kennedy Executive Education.

2 Workforce:

Showcase nationally and raise profile of innovative workforce redesign such as United Lincolnshire Hospitals NHS Trust’s Cardiology Acute Care Practitioners which have reduced admissions and added real quality to the Emergency care pathways.

Contact: Alun.roebuck@ulh.nhs.uk

2. The NHS National Commissioning Board could showcase/raise the profile of innovative workforce redesign.

3 Support and recognise University offerings to Innovation adoption such as the Open University Technology Adoption learning Network.

Contact: Professor Clive Savory c.savory@open.ac.uk

3. The NHS National Commissioning Board could formally invite/fund Universities to support innovation adoption.

4 Without a map where are you? Where are you going and where have you been – lets have an innovation roadmap which sits within and across the Outcomes framework domains

4. NHS Commissioning Board to commission or set out an innovation road map against which the progress to leading edge service delivery is measured.
The Future of Work
A New Approach to Productivity and Competitive Advantage

By Malcolm Frank, Senior Vice President, Strategy & Marketing, Cognizant and Geoffrey Moore, Managing Director, TCG Advisors
A Foreword by Geoffrey Moore

The future of work is being reshaped by two trends that, when combined, create an entirely new approach to productivity and competitive advantage. The first of these is the virtualization of work, by which we mean the disaggregation of end-to-end value chains performed by a single company, into a networked collaboration, in which each company contributes its core specialization, all orchestrated and governed by global ERP systems of record. Virtualization of work has led to the globalization of the world economy, bringing developing economies to the table, initially to contribute low-cost labor, then to provide high-growth emerging markets to sell into and, most recently, to host sustainably differentiated centers of talent.

The second trend is the consumerization of IT as enabled by cloud computing, something we all have experienced in our personal and social lives in the numerous online facilities that have reshaped how we communicate, collaborate, learn, buy, engage and consume. This trend has become so pervasive that its absence from the enterprise IT domain has become a global embarrassment, albeit an understandable one, given the complex demands on security. The forcing function for its deployment in business applications, however, will be its ability to accelerate the collaboration and trouble-shooting necessary to operate global, ecosystem- and knowledge-based, as well as physical supply chains at scale.

When the virtualization of work meets the consumerization of IT in the enterprise – and when systems of record meet systems of engagement – the dynamics of work itself change. The core rationale for vertically integrated corporations with co-located employees in company buildings, all marching to a command-and-control culture – all that is removed once you have anytime, anywhere systems that create virtual presence. This enables the offloading of non-core work to the ecosystem, processes so mission-critical it was heretofore unimaginable that we could let another company perform them on our behalf.

To maximize the benefit of offloading non-core work, enterprises must also re-examine what is truly core to them, as
global services providers develop more and more sophisticated capabilities that enterprises can leverage. It also enables a new generation of collaborative innovation — work conducted under what some are calling the millennial mindset — which is all about tapping into social networks at every stage of the problem-solving process. This, in turn, is also helping to engage the millennial generation with enterprise issues and concerns, whether as employees, customers or partners.

To prepare for the impact and capitalize on the opportunities introduced by the future of work, enterprises must revisit their internal organizational models and cultures, their external relationship models and commitments, and the IT systems needed to connect all parties together in a productive, responsive ecosystem. These next-generation systems of engagement will complement the current generation of systems of record, to create the enabling fabric of future work.

In this context, the discipline of business process analysis must refocus on the overall architecture of work rather than the optimization of component processes, the strategic issue being to determine what stays inside the corporation and what gets delegated to trusted partners. In parallel, enterprise IT professionals need to get out in front of the adoption of systems of engagement by working with their colleagues to determine what moments of engagement are most deserving of receiving this additional firepower in the first wave, which employee roles represent the company in these moments, and what next-generation IT-enabled communication and collaboration capabilities could most impact the outcome at these key junctures.

This will set a whole new IT agenda, forcing a wave of innovation around making systems of engagement enterprise-ready, driving a whole new category of IT spend, and revamping the power hierarchy in the IT industry around a next generation of leaders.

To explore this dramatic change further, my colleagues at TCG Advisors and I partnered with Malcolm Frank, a Senior Vice President at Cognizant, as well as his executive team, to prepare the following primer, entitled “The Future of Work.” We believe this is the beginning of a global conversation, and Malcolm and I look forward to broad participation from every industry and every corner of the world. We welcome your feedback.
Preface

It’s happening to more and more of us. On Sunday evening, we open up our dazzling personal computing devices and enter an entirely different place, an online world that is virtual yet rich in understanding, global yet intimate and, while running on silicon and fiber, refreshingly human. It’s a place of friendship, ideas and commerce, the best and most obvious place for many genuine moments of engagement. We’re learning – very quickly – how to merge this highly personalized virtual world into our physical worlds, often greatly enhancing both places. We’re becoming conscious of not just the utility but, yes, the transformation that broadband, mobility and social computing have brought to our lives. Personal technology has become an enhancer, a multiplier, in our personal lives.

Then Monday morning arrives.

After once again suffering through the indignity, inefficiency and unsustainability of another commute, we settle in at our desks. As the PC hums through its bootup process, our eyes dart between the enterprise applications loading on the screen and the flashing red voicemail light on the phone. Yes, the standard-issue computer provides access to standardized systems of record yet offers precious little human engagement. The “dumb” phone won’t follow us past the length of its cord. It’s all so restrictive and confining. Work technology has become a limiter in our professional lives.
The juxtaposition between the Sunday night and Monday morning computing experience has simply become too harsh. All around the world, business professionals are fed up. They are fed up with the yawning gap between their engaging and customizable personal IT experience and their rigid and mandated work IT experience. Reminiscent of the movie *Network*, they are throwing open the proverbial window and shouting, “I’m mad as hell, and I’m not going to take it anymore!” The gap between the two must and will be closed, not to mollify the new generation of workers but to enable them to conduct great work and help the organization attain new levels of performance. It’s inevitable that companies will embrace these platforms of collaboration as aggressively as individuals and society have.

This Sunday night vs. Monday morning experience may seem rather simple, a manifestation of the consumer adoption of new technologies. However, it’s indicative of a shift that is much broader and deeper, one that will reshape industry and company structures altogether. It is our contention that we’re currently living at an important “shift point,” a time where key megatrends are reshaping the rules of markets, how work is conducted and value is created. It is incumbent that today’s managers understand these megatrends cold, interpret them in the context of their industries and organizations, and then recognize what to do about them.

This is the future of work, and it’s upon us.
Executive Summary

“The future is already here - it is just not evenly distributed.”

— William Gibson

We don’t need to look too far to see new future of work operating models already in practice, for many of them are currently hiding in plain sight. In certain pockets of industry, the future of work is thriving, and the organizations that have embraced it are currently among the performance leaders in their industries. One can find certain applications of it in companies such as Apple, Netflix, Google, Salesforce.com, Cognizant and Best Buy, which have grown smartly through the headwinds of the Great Recession. Throughout this white paper, we will investigate how these organizations and several others are taking advantage of driving mega-forces in today’s environment, developing key strategies for the new environment and experiencing superior results.

We will outline our view of the emerging future of work in three sections:

1. The first, “Setting the Context,” looks at the economic forces driving the current version of the globalization of the world economy and how this globalization is driving the virtualization of work. This is the environment we all inherit and must ultimately come to terms with. In particular, we will review four large and growing forces that are changing entire markets and business models: globalization, virtualization, the millennial generation and cloud technology.

2. The second section, “Setting Strategy,” looks at the levers available to enterprises to engage with the new context in ways that are both productive and differentiating. Here, we take our cue from the consumer sector – what some call “the consumerization of IT,” which in the last decade has dramatically reengineered life experiences in compelling ways. We see these levers being useful not just in the consumer space, but also in enabling the reengineering of
enterprise IT. By embracing tools and techniques pioneered and perfected in the consumer world, IT will take center stage in the creation of a new organizational structure, where highly virtualized and collaborative ways of working enable more timely and effective sharing of knowledge among associates, business partners and customers. How these ideas can be applied to strategy is the subject of this section.

3. Translating these strategies into action is the subject of “Setting Forth,” a look at the execution agenda needed to transition to systems, processes and organizations that are fit for purpose in the new world of work. Here, we draw on some of our leading customers, as well as critical home-grown initiatives within our own infrastructure and culture, to provide an early view into how companies can invest in the present to capture returns both now and in the future. We will look at how work is being re-architected in leading enterprises, as well as the emergence of systems of engagement.

These are “project-ready” ideas, which we would be happy to support as-is. At the same time, these are clearly still the early days, and we hope and expect to be part of a large number of innovative initiatives in the years to come that will, in and of themselves, help further define the future of work.
Setting the Context

Globalization of the World Economy

If globalization were a baseball game, it would still be in the early innings. To put this movement in context, in 1989, when the Berlin Wall fell, there were roughly 600 million participants in the “global” economy. After all, participation in capitalism at that time was truly limited to North America, Western Europe, Japan, Australia, New Zealand and a handful of “tiger” countries in the Asia-Pacific region. One generation later, there are approximately five billion participants. Brazil, Russia, India and China (comprising the “BRIC” faction) account for 3.3 billion new participants alone, and clearly, Eastern Europe, Latin America, select regions of the Middle East and Africa have opened up with exciting dynamism. The full impact of this is far from reaching fruition.

Yet, it is clear that organizations need to rethink their approaches on both the supply and demand side of their businesses as markets move to full globalization. During the 1980s and ‘90s, industrial globalization transformed manufacturing (the Toyota model) and retail (the Walmart model). The current generation of knowledge globalization will bring similar transformation to knowledge industries, where the product is based on intellectual property instead of widgets. Indeed, companies in financial services, life sciences, media, entertainment, communications and information technology now represent over two-thirds of the Fortune 100.

Much has been made of globalization, but it’s been an extraordinary and unprecedented change that, from a historical context, has happened in the blink of an eye.

Industrial Globalization Gives Way to Knowledge Globalization

Why is this shift important? First consider the (limited) pre-1989 version of globalism and its focus on manufacturing and hard goods, most of which were delivered in “batch mode.” Once Japan’s industrial model took hold, it had a severe impact on U.S.-based industries, from automobiles, to steel, to consumer electronics. Over the past two decades, this model has morphed and accelerated with the advent of the Internet and the World Wide Web as global communication utilities. Originally conceived as “information highways,” it soon became clear they were also “work transport highways,” enabling whole sectors of the global economy to transition to a contract manufacturing model, largely hosted in China and, subsequently, to a contract service model, notably hosted in India.

On these work transport highways, digits (as ones and zeros) don’t recognize political boundaries. Similar to water finding its level, knowledge work will find its proper location around the globe, doing so with great efficiency and few barriers. This will significantly impact both the supply and demand sides of your business model.

Supply Side

Today’s knowledge globalization is creating significant opportunities on the supply side of the business. Expertise can now be accessed seamlessly, anywhere and everywhere it lives, as the costs of communication and coordination have dropped to near zero. How can you harness the collective intelligence of your global workforce? ... Of your full supply chain? ... Of the globe itself?

In 2010, China will produce approximately 600,000 graduates with four-year engineering degrees. India will produce 350,000, while the U.S. will produce 70,000.¹ The world has already been finding use for this talent; in the past decade alone, more than one million IT jobs have been created in India to support the computing needs of Western companies. Importantly, this globalization of work is not being
conducted only in batch mode, but is also being delivered at the most atomic level of work on a real-time basis. As such, the coming disruptions from knowledge globalization will be more dramatic and much faster than those of the industrial model of 30 years ago.

**Demand Side**

This form of globalization will offer as many opportunities as it does threats, for developing markets are opening up significant demand. After all, last year in China, Buick sold its two millionth car in the country, and Apple’s iPhone sales increased nine-fold as Apple added 800 distribution centers just to keep up with the voracious demand. The middle class in China alone currently stands at 290 million people and is expected to grow to 500 million by 2025. Clearly, globalization is creating opportunities on the demand side of the business. As consumer markets develop around the world, does your business model support this opportunity? Recently, the CXO of a Fortune 200 consumer goods manufacturer lamented, “Two-thirds of our demand is now outside the U.S., but two-thirds of our supply chain is still within the U.S.”

**The Virtualization of Work**

While public discussion about globalization has escalated in recent years, the virtualization movement has been greatly under-hyped. When history is written on the years of the Great Recession, one of the hallmarks of the era will be the virtualization of the organization across multiple dimensions, including its technology, people and business model. This is the age of “the great decoupling,” during which tightly coupled physical environments – such as supply chains or office environments – are collapsing under their financial weight and sluggishness, moving to a more virtualized model.

What’s driving this mass virtualization? The first driver is cost, as it’s the fastest way to more efficient operations. The second reason is counter-intuitive, yet more profound. Communications and coordination – and the information revolution emerging from social networks, telepresence and mobility – are enabling new levels of collaboration, changing the way we deploy technology, where and how we work and how the organization itself is structured. Prior to the introduction of these technologies, rich communication and coordination could only be conducted in point-to-point and “hard-coded” ways (either in-person or over the phone). Now, these rich interactions can occur dynamically and in a loosely coupled way. The implications are profound and are starting to alter both the manner of organization and the means of creating value.

We see three key virtualization trends:

1. **Virtualization of Technology**: From an IT perspective, technology virtualization has been the number-one priority item for corporate technology departments for the past three years running. In its simplest definition, technology virtualization is the separation of the software from its underlying hardware resources. By decoupling the software from the hardware, the virtualization movement has driven enormous efficiencies in IT. For example, prior to virtualization, hardware was physically coupled with dedicated software. And often, this hardware was utilized less than 20% of the time. (This was akin to an airline letting a 747 sit idle on the ground for nearly 19 to 20 hours...
a day.) Through virtualization, computing resources can be efficiently distributed and utilized. This approach is of such value that it’s been extended across all applicable portions of IT, including servers, desktops, data, networks and storage.

2. **Virtualization of the Human Work Experience:** In parallel, the human work experience is being virtualized, as more and more knowledge workers are working remotely (from home or a third place): In 1999, there were 11.6 million Americans working from home. Today that number is 23.5 million, or 16% of the total workforce. In the U.S., the majority of IBM’s and Hewlett Packard’s employees now work from home. In retail, Best Buy has moved to a “results-only work environment” to great effect, where non-store employees are allowed to work wherever and whenever they wish – provided they deliver results. And if you call the customer service lines of JetBlue, Hilton or 1-800 Flowers, the customer service agent on the other end of the line is not in a call center but working virtually from home.4

3. **Virtualization of Process and Organization:** Prior to the recent recession, in most corporate departments, one would find knowledge work “tightly coupled:” That is, all the people, information and systems required to perform a function were located in one physical place. However, running a company in this manner today is similar to using Facebook only with the members of your household. It defeats the purpose. No longer do the physical plant and the people all need to be co-located, for the work is no longer structured in this manner. In today’s environment, people, information and systems are being de-coupled, put into their best locations and then pulled together dynamically and virtually.

**Historical Precendence**

So why is this all happening now, and with such velocity? Again, history provides a useful perspective. The hierarchical organization came into focus two millennia ago, with the Roman legions. The Romans – through the efficient communication and coordination afforded by the hierarchical structure in their army – were able to dominate their world. Today, their organizational model is easy to recognize, for it’s a pyramid structure that currently runs most of today’s large enterprises. Yet by 2020, for most industries, this currently prevalent model will be largely wrong.

A second great organizational breakthrough came a century ago: the vertically integrated company. Henry Ford and Alfred Sloane drove their companies to prominence by recognizing, yet again, that the key to success was found in superior communication and coordination. As such, by winning in the automotive market, they quickly realized they needed to own as much of the supply chain as possible: from raw materials, to suppliers, to the factory, to distribution, sales and service. Trying to conduct this through partners – with communication technologies of the time – proved to be far too difficult to manage.

Today, the very basis for the hierarchical, vertically-integrated company model is coming to an end. The communication and coordination equation has changed completely... and with it, the raison d’etre for these models.

More recently established companies provide practical insights into this virtually-coupled model in action. For example, think back to your last e-shopping experience. You were on your social network (company #1) when you heard about a new offer that intrigued you, so you searched (company #2) to get more information.
about it. That sent you to a site (company #3) that had a cool video (company #4) that motivated you to buy the product. Once you clicked to pay (company #5), you received an e-mail explaining when your order would be shipped (company #6), and subsequently you were alerted on your mobile phone (company #7) that it was arriving later that day. Seven highly specialized companies seamlessly integrated their business processes to enable this everyday experience. That is what we mean by saying that the present of play is defining the future of work.

The Millennial
The generation currently between 15 and 35 years of age is the first to have grown up online, and with this perspective, members of this generation are starting to change the social and operating norms of the corporation. Soon, millennials will be the majority of your employees and customers (if they aren’t already). They will force significant change on how your company is managed, how its products and services are sold and how technology is deployed.

In many circles, millennials have developed a reputation as an over-tattooed, hyper-pierced, unserious generation of slackers. This is the furthest thing from the truth. (OK, maybe not the tattoo thing, but we won’t editorialize.) Millennials represent the smartest, most unified, interconnected and globally-minded group we have seen for generations. Yet, what must be recognized by today’s baby boomer-generation managers is that millennials are different. In fact, the irony shouldn’t be lost on anybody of boomers who brag about the differences they have with their parents (of the Greatest Generation) and then complain about how they don’t understand their children. Millennials are as different from boomers as boomers were from their parents. It’s just that the differences aren’t as obvious, for they are not necessarily in what millennials do but in how they do them.

The basis of the millennial difference is that they represent the first generation of digital natives. There’s the old adage that “Technology is what was invented after you were age 12.” For millennials, the Internet was available when most of them were in their early formative years. This generation has grown up online, viewing Web access and interactions as being fully natural. This has manifested a collective mindset that celebrates collaboration and assigns equal value to virtual and physical interactions.

Let’s look at a simple college assignment: a five-page term paper. When a boomer was in college, in order to research and write this paper, he would have to walk to the library, search for relevant texts in the Dewey Decimal system and physically look for the books in the stacks (maybe only finding three of the five books listed). He would then go back downstairs, reading through the text for several hours, taking copious notes and shoveling dimes into the library’s Xerox machine, making copies of key passages. He would highlight key points, begin to formulate his argument and create an outline. Finally, he would then set forth on writing the paper (probably by hand).

By contrast, how would the millennial have addressed the same assignment? She wouldn’t leave her dorm room. Instead, she’d first get onto Facebook and ask her friends, “Who took this course last year? And who might have information on what the professor is really looking for with this assignment?” Quickly, five or six suggestions – customized and in the right context – come back. She would then go onto Wikipedia for some preliminary research, and the entry would then lead her to some of the richest sources of information available on the topic. She would follow up by going onto Twitter for some of the latest thinking on the issue and then conduct some Google searches to fill in any missing gaps.

This generation has grown up online, viewing Web access and interactions as being fully natural. This has manifested a collective mindset that celebrates collaboration and assigns equal value to virtual and physical interactions.
The educational experience of the boomer was highly individualistic, physically-based, narrow in information and laborious (with much of the effort—from walking, to Xeroxing, to handwriting—being completely superfluous). By contrast, the educational experience of the millennial is highly collaborative, virtually-based, broad in information and very efficient.

Is it any wonder that these two generations frame problems differently? And—with this educational training—is there any wonder why the millennial generation (whether as customers or employees) finds much of the corporate environment limiting and suffocating? More importantly, is it any wonder many millennial employees look at existing knowledge-based processes and recognize they are as inefficient and limited as writing a term paper without access to online communities and information resources?

So, to what level are millennials now using their social technology platforms?

- The average teenager in the United States sends 3,339 text messages per month.
- Facebook has more than 500 million active users today, with 50% of those users logging on every day. In fact, Facebook users now spend more than 700 billion minutes per month on the site. Recently, a major Internet Service Provider (a client of Cognizant’s) shared that when the Facebook site went down for a few hours in October 2010, the ISP’s call center was inundated with callers asking “Why has the Internet stopped working?” The Internet of course was perfectly fine, but for these users Facebook now represents their window onto the Web.

When asked what makes their generation unique, the top answer for millennials was “technology usage.” For boomers, the answer was “work ethic,” and for the Greatest Generation, it was “surviving the Depression and WWII.”

As self-described experts, millennials live—enthusiastically—in virtual and physical worlds, and they will expect their corporations and governments to do the same. There’s no turning back.

Cloud Technology

To date, there have been four primary corporate computing architectures: Mainframe, minicomputer, client/server and the Internet. We are at the beginning of the fifth dominant architecture, which will be based upon mobility, social computing, broadband and cloud-based models. Importantly, the cloud architecture enables platforms of collaboration that—through their rich abilities of communications and coordination—are opening up new and significantly more efficient business models.

The current view on the cloud is, well, hazy. Confusion reigns regarding the promise and reality of “cloud computing.” Definitional debates surrounding what constitutes cloud computing have obscured the importance of this emergent computing model. For the purposes of this discussion, we will use a broad definition that includes social computing + mobility + broadband and telepresence + virtually hosted systems.

The adoption rates for consumers in this cloud environment are nothing short of extraordinary, particularly considering the depths of a wrenching economic downturn. As John Adams famously said, “Facts are stubborn things.” Judging by the facts surrounding current adoption of cloud computing models, this trend has a velocity previously unseen in technology, as evidenced by adoption rates, performance and cost. For example:

- **Device Adoption**
  - iPad adoption is the strongest in the history of electronic products, as less than a year after introduction, its current sales run rate is approximately 4.5 mil-
lion units per quarter (compared with DVD players, which, upon their record-setting introduction, sold 350,000 units per quarter).  

Google’s Android mobile smartphones are being activated at a rate of more than 250,000 per day in the late summer of 2010. The product has reached 16% market share in less than one year and will soon eclipse the (previously remarkable) market adoption of the iPhone. In fact, at the current pace of adoption, overall smartphone sales will surpass overall PC sales in 2012.

**Performance and Cost**

- Salesforce.com services its 75,000-plus clients with 15 billion quarterly transactions, reliability of 99.999999% and transaction times of 300 milliseconds.

- Google uses one system admin per 20,000 servers, while Amazon’s storage costs run 15 cents per gigabyte per month. YouTube spends just $10 per megabit for networking.

This momentum of the cloud architecture has created a crisis within corporate IT departments that was not of their making. IT consumers are frustrated with the experience (Sunday night vs. Monday morning issues). Finance is asking tough questions about performance and cost. Any answers (from IT) that start with, “Well, it’s not that simple…” will no longer suffice.

We’ve been to this rodeo before. When corporate IT architectures shift (e.g., from mainframe to mini, mini to client/server, client/server to Internet) there are new technology acolytes who will – often noisily – argue that the entire corporate platform needs to move to the new architecture. Historically, this has proved to be fallacious, and it will again be the case. In the prior three shifts, the new technology complemented the existing IT platforms, and investments in the new platform were justified through new business value or capabilities enabled by the new technology. For example, with the commercialization of the Internet 10 years ago, e-commerce systems sat atop existing mainframe and client/server platforms. The cloud movement will be no different. The key – as outlined later in this document – is to pick the right places for the deployment of new technologies.

On their own, any of the four aforementioned forces – globalization, virtualization, millennials and cloud computing – would have a huge impact upon most organizations. Together, their impact is enormous and is already shifting the floor under entire industries. In reviewing these mega-forces, the current state of the publishing industry emerges as the proverbial canary in the coalmine. As examples, witness the impact of (and financial value shift from) Google, Craigslist and mobile devices on the newspaper industry. These shifts have had a similar impact on the magazine industry. For example, in August 2010, Newsweek was sold for one dollar. What other venerable institutions – if not reacting to these mega-forces – will be sold for a buck?

### Setting Strategy

**The Challenge for the Next Decade: Building Enterprise 2.0**

Global business dynamics of the sort just addressed are already driving enterprises to reexamine their strategies for re-architecting work and re-deploying the workforce. In short, we believe the overarching challenge for the next decade is in building the next-generation workplace, or the so-called Enterprise 2.0. This approach, when properly applied, holds the promise of not only driving efficiencies and effectiveness by leveraging the aforementioned four forces, but also increasing organizational speed and innovation.
As a leader in your organization, how do you go about building Enterprise 2.0? How do you make sense of, and take action on, the four forces outlined above? The key is in focusing on two powerful, and interrelated, issues: 1) the virtualization of work and 2) the consumerization of IT.

Through the virtualization of work, we’re witnessing a mass de-coupling of physical work into a balance of the virtual and the physical. In much the same way that a typical millennial has found a balance – and enrichment – through a new physical/virtual equation, winning companies of the next decade will do just the same. Today’s ponderous end-to-end value chains – executed mostly locally and predominantly with internal resources – can be disaggregated into networked collaboration, with work being conducted in the right location, by the right people, at the right value point. To be clear, virtualization does not equal a loss of control. In fact, with the proper application of IT (through ERP backbones, infused with social technologies) control and coordination are actually increased. In the same manner that social and mobile technologies have established platforms of collaboration and engagement in our personal lives (e.g., in a Facebook or Twitter model), in a corporate environment, these technologies will create new platforms of collaboration and systems of engagement.

So how do we frame the issue? In looking to the work architecture for Enterprise 2.0, the key questions to answer are, what work remains physical (with co-location of employees) and what work can go virtual? Which processes should be tightly held, and which ones can we relinquish to others, and where are the critical junctures we must manage with vigilance? Moving down one level, within processes for which we retain responsibility, where are the value-adding (or risk-introducing) nodes, and how can we apply more of our total resource base at these strategic inflection points? And for processes we relinquish, how do we maintain visibility to ensure we continue to meet our mission-critical obligations?

Turning from work to the work force, the first question to ask is, where do we want physical presence, and where will we choose instead to deploy virtually? Going deeper, what kinds of people do we want to deploy across key functions, and for which skills do we need to hire and train? And as we look more closely at virtual deployments, what digital systems are needed to power virtual engagement, and who has the most need for them? And how will these systems of engagement interface with and leverage both our enterprise systems of record, as well as public networks and consumer-oriented services?

In this section, we will review three key elements for making sense of – and then charting a course to drive value from – the future of work:

1. Powering knowledge processes with new systems of engagement.
2. Managing the new core vs. context equation.
3. Understanding the new organizational model.

**The Rise of the Knowledge Process**

It is our contention that the creation of Enterprise 2.0 will occur at the process level, with a particular focus on “knowledge” processes. These are processes where value is created not by the creation, movement or management of physical goods (such as managing the factory floor, logistics or service operations), but by the creation and management of intellectual property. In today’s context, this focus is
increasingly important, for the Great Recession has exhibited that fortunes are being made (and lost) on the management of these core knowledge processes.

The key ingredient for a knowledge process is the moment of engagement: where the right people – with the right information, at the right time, in the right context – make critical decisions.

Each large organization has scores of these processes, and in knowledge-centric industries, these processes are the central platforms of competitive advantage. For example, in banking, loan decisioning and wealth management are key knowledge processes. In insurance, underwriting and actuarial services serve as examples. In life sciences, the processes of drug discovery and clinical trials sit at the center of value creation.

The four forces we’ve described above will catalyze these knowledge processes in significant ways. Knowledge processes, by definition, should be virtualized, tapping into the best insights and capabilities wherever they may exist. In fact, it’s now becoming clear that, to date, most knowledge processes have been architected and managed in very limiting and expensive ways. Specifically, the application of industrial principles (which made perfect sense in, say, managing the factory floor) to knowledge work have been counter-productive in many ways. As such, we’re entering a period in which the full potential of knowledge processes is about to be unleashed.

How does one start to find the most appropriate knowledge processes for the Enterprise 2.0 model? The first important step is to recognize this new landscape of “core vs. context,” to understand it in your environment, and to take action on it.

Redefining Core & Context

Core is what your firm does better than anybody else. Context is table stakes for your industry. The best organizations are clear-headed about the two, while mediocre ones confuse them far too often. Today (due to the four forces), the water line between core and context is rising faster than ever. Need a good explanation of core vs. context? If you have an Apple product handy, take a look at the back of it. The label reads, “Designed by Apple in California.” Five simple words, but a wonderful articulation of the expanding gulf between core and context. The label does not read “Made in China,” which would reflect an industrial mindset. Apple, with its knowledge mindset, creates unique value through superior design and customer experiences (both physical and virtual), and understands that – for it – most everything else is contextual. Such clarity is vital in this emerging marketplace.

Business process strategy, in aggregate, continues to be an exercise in extracting resources from non-core or context activities in order to repurpose what is core. As ecosystems evolve, the core/context boundary is ever-shifting, so the extract/reallocate exercise is dynamic, and the systems that enable it must be flexible.

What is relatively new in this process is the increasing need to transfer responsibility for processes that are non-core but still mission-critical. These are risk-bearing responsibilities, wherein failure can be hugely consequential (think of the Madoff investment scandal or the BP deepwater drilling disaster). Unfortunately, because global business dynamics continue to force higher and higher return on assets, businesses have little choice but to take on these risks – they simply cannot absorb the low returns from the investments needed to keep these processes in-house. At the same time, next-generation investments in core processes are also under pressure. They must drive sufficient competitive differentiation to warrant a price premium, or else they too do not generate sufficient return on assets.

The key ingredient for a knowledge process is the moment of engagement: where the right people – with the right information, at the right time, in the right context – make critical decisions.
The net of all this is that business process analysis around what is or is not core, and what is or is not mission-critical, must become increasingly granular and precise. At the same time, inter-process linkage and communication and remote process oversight become fundamental to new process design. Again, the same four forces that underlie the new opportunity for productivity and competitive advantage apply here, as well:

- **Virtualization of processes.** When it comes to business processes, virtualization equates to “de-localization.” This means extracting the work process from a specific locale, where historically it has been co-located with related processes in the value chain, thus enabling its execution elsewhere and by others. This entails envisioning each process as a service that can be invoked by a message and that returns its output at a designated time and place. This is what is meant by the disaggregation of the value chain.

- **Globalization of processes.** Once business processes have been virtualized, their execution can be leveraged by internal and partner resources, globally. Historically this has been driven by labor wage arbitrage, but in the future of work, it is more likely to be driven by centers of excellence that attract talent and investment far in excess of competing locales. In much the same way, we recognize global centers of expertise in the traditional industrial economy (e.g., fashion from Paris or Milan, carpets from the Middle East, consumer electronics from Japan), knowledge-based centers of expertise are beginning to take form.

- **Millennial mindset for processes.** Peer-to-peer governance is critical to success with a disaggregated value chain. Everything from putting in place the IT systems that detect anomalies in the process, and the communication and collaboration facilities needed to address them in a timely way, to building empowered personal relationships of trust needed to coordinate joint responses—all of these activities unfold in ways that aren’t possible in a traditional command-and-control approach. Embracing the millennial mindset is a journey of cultural self-awareness that enterprises must undertake to inform new ways of working. Understanding and then embracing this mindset is not optional—for this new mindset is becoming the new cultural and operating norm.

- **Cloud infrastructure for processes.** Public and private networks are the transport mechanism for business process exchange. For all processes, they transmit the metadata needed to ensure the system is operating within designated norms. And for digital goods and services, they are the delivery system, as well. Just as the Internet and the Web were the fundamental enablers of the first generation of outsourcing, so the cloud will be to the next generation.

### The New Organization Model for Enterprise 2.0
The future of work will have a dramatic impact on traditional organizational structures. Most companies are organized based on assumptions or constraints that existed in the 1920s, ’50s, ’70s or ’90s. However, in today’s environment, many of these models are antiquated and counterproductive. As we discussed, the classic pyramid of hierarchy will give way to a more networked model requiring new management approaches and systems. Also, the asset-heavy, vertically-integrated structure is giving way to a model of true partnership and virtualization.

Specifically, this means focusing the enterprise on critical moments of engagement—encounters that make or break business success, and doing everything possible to maximize the organization’s impact precisely at these moments.

In engineering-oriented product leadership strategies, these are often moments of adoption, where customers, fatefully, either do or do not buy into the new paradigm.
In sales- and marketing-oriented customer intimacy strategies, they are more likely to be moments of trust, when customers or partners either pull you in or shut you out from their next set of actions. And in supply chain-oriented operational excellence strategies, they are more often moments of risk, where success equates to higher margins, and failure means expensive scrap and rework. But in all strategies, critical processes come to a head in moments of one kind or another, and companies can and should organize to make sure the best of their capabilities are in play at these times.

Again, the four forces come into play:

- **Virtualization of the organization.** To overprovision during strategic moments of engagement, one must be able to extract resources from other uses. This is not a new idea (Bill Davidow’s *The Virtual Corporation*, for example, was published in 1992!). What is new is taking virtualization to a whole new level by leveraging systems of engagement. This next generation of communication and collaboration technologies permits enterprises to operate in a far more interdependent way than before, thereby reducing context work and freeing up resources in each of the companies involved. Each company must still retain and maintain a process management layer, to be sure, but the assets to execute can be redeployed for competitive advantage.

- **Globalization of organization.** In a virtualized economy, it is more important to organize around markets than supply chains. The great domestic markets of the 21st century will be in the developing economies, and corporations will need to get their marketing and R&D as close as possible to these new sources of wealth. This will entail systems of engagement for internal use to keep all the members of the global enterprise flying in formation.

- **Millennial mindset on the organization.** While governments may still maintain a we/they, here/there, import/export mindset focused on maintaining borders and balances of trade, global corporations and their customers will be operating in a world unified by global communications, where connectedness is omnipresent, transparency unavoidable and market responses swift. The idea of running such an operation out of corporate headquarters is simply a non-starter. Networked structure, or peer-oriented organization, will become synonymous with global operation.

- **Cloud infrastructure in the organization.** The best way to think of the cloud in this context is that the Earth is sprouting a new nervous system that will enable emergent behaviors we have never before witnessed. This, to be sure, is both an opportunity and a threat, but first and foremost, it is an inevitability. 21st century corporations must invest in systems of engagement needed to plug into this emergent order or risk the marginalization that must follow from being displaced.

**From Setting to Implementing the Strategy**

The road to Enterprise 2.0 will run through your key knowledge processes. To get started, take inventory of these key knowledge processes and determine the most appropriate ones for key systems of engagement. In asking the simple question, “If we were to establish this process today, how would we do it?” many revealing answers are often provided. Quite often, this simple exercise leads to the answer of, “We shouldn’t be running this process — or at least portions of it — any longer.” Thus, the focus on knowledge processes will lead to the second key strategic cornerstone: focusing on the new core vs. context.
Once you begin to implement Enterprise 2.0 in the context of a key knowledge process, the foundations of the new organizational model will begin to unfold. Once the better-faster-cheaper attributes of the new model are operationalized at an atomic level (in the context of well-understood processes), the power of the network model — infused into the traditional hierarchical organizational model — begins to be well understood.

**Setting Forth**

Because Enterprise 2.0 is so deeply entwined with the future of IT, and in particular with the deployment of systems of engagement, it is here that the journey forward must begin.

**The Renaissance of Corporate IT**

Between 1960 and 2000, corporate IT was at the vanguard of technical innovation. Very simply, it was where the real action was in the application of computing. Yet, the past decade has represented a “dark ages” in terms of innovation in corporate IT. After the Internet bubble burst, corporate IT has been characterized by austerity programs, where the overriding mantra has been “keep it cheap, secure and stable.” This has also been reflected in the IT vendor community as well, given the acceleration of industry consolidation compared with the snail’s pace of innovation.

In the next five years, it is our position that corporate IT will awaken from these dark ages and enter a renaissance. By enabling the new enterprise models, fueled by knowledge processes and held together by social technologies, IT will return to center stage. For too long, CXOs have often thought of “strategic computing” as an expensive oxymoron. In the future of work, that will all change, as IT will not only be more efficient, but also truly strategic and innovative in nature.

The new IT strategy is all about diverting investment from systems of record in order to fund and deploy next-generation systems of engagement.

**The Rise of Systems of Engagement**

For the past 20 years, companies have focused on building out their systems of record. By systems of record, we mean all the compute-oriented OLTP database systems that have been at the heart of enterprise IT for the past four decades. They are the interstate highway system of global commerce, the sine qua non for being a global enterprise, but they are now largely deployed, and the focus must shift to maintaining them. This is, indeed, a mission-critical responsibility, but it does not warrant anything like the IT budget required in the past — hence the most recent decade’s intense pressure on IT to reduce costs.

These systems include many different varietals of application — ERP, CRM, HR, etc. — on many different platforms, from mainframes, to client/server, to global single instances, to SaaS. But these all served the same purpose — to order, structure, control and accelerate the movement of data through the extended enterprise (including business partners and customers). The work of systems of record is now largely done.

Systems of engagement are the communication-oriented collaboration systems that enable distributed teams to work effectively in tandem. This is the nervous system of the global value chain, and it needs an upgrade. First-generation systems were fundamentally document-centric, but as the consumer IT revolution has shown us so dramatically, next-generation systems are session-centric. They organize around end users in the present moment to fundamentally empower them to connect, engage and transact without friction. As such, these are core to the strate-
gies of companies seeking to collaborate more effectively in B2B relationships and engage more compellingly online in B2C interactions.

There are four fundamental pillars that enable IT organizations to migrate funds and staff from systems of record, to systems of engagement, as follows:

- **Virtualization of IT.** Well under way in most enterprises, virtualization of software and infrastructure (PCS, servers and networks) extract resources from current (and more importantly, future) IT spend to free up staff and budget for next-generation investments. If you have not virtualized your IT environment, you are spending too much money on IT infrastructure. It is just that simple.

- **Globalization of IT.** Also well under way in most enterprises, globalization helps further extract resources from the IT budget by transferring non-core work to lower-cost developing economies. This further frees up staff and budget for next-generation investments.

- **Millennial mindset in IT.** The guiding principle of systems of engagement, the millennial mindset stands for the transition from a hierarchical, command-and-control system of relationships, to a collaborative, peer-to-peer orientation. Problem solving is inherently team-oriented, and instant communication is core to the exercise. The consumer IT experience is the touchstone for this paradigm.

- **Cloud infrastructure for IT.** Whereas systems of record were architected for independent enterprise data centers, and for the most part will be content to remain there for years to come, systems of engagement are architected for cloud deployment, be it public, private or a hybrid of the two. Because collaborative business models are inherently inter-enterprise, participants need a common ground on which to connect. Thus it is in the cloud that the future of work will unfold.

To attain the future of work, IT strategy is all about diverting investment from systems of record to fund and deploy next-generation systems of engagement.

**Moments of Engagement**

The history of IT makes clear that in every technology adoption lifecycle, four motives evolve in sequence to drive and reward investment in disruptive technologies. They are:

1. **Competitive advantage** from being first to deploy a game-changing capability (think Amazon in bookselling).

2. **Fixing a broken process** by being first to apply next-generation technology to address a hitherto unsolvable problem (think GPS RFID tags for tracking livestock).

3. **Broad productivity gains** from participating in a wholesale market transition to next-generation infrastructure (think laptops, cell phones and Web sites).

4. **Cost reductions** from established technologies as they benefit from Moore’s Law and learning curves (think storage, servers and LANs).

In this context, the adoption of systems of engagement are for the most part still in stage 1 of the lifecycle. As such, they will return the greatest rewards to enterprises that
focus their deployment on gaining competitive advantage. So how is that best done? It begins with getting clarity about wherein lies your specific enterprise’s core differentiation. The question to be answered is, what activity that has customer value do we intend to do so well and with such commitment that our direct competitors either cannot or will not match us? What, in short, is our claim to fame?

We call answering this question declaring your core. Once declared, the core serves as a pole star to set a return on investment standard for any initiative’s impact on strategic competitive advantage. As such, the core is invaluable in negotiating inevitable trade-offs in the budgeting and staffing process. The key IT question here is, How would any proposed system enable or amplify our core?

To answer this question, business and IT analysts must work together to determine the precise moments of engagement where core differentiation can have its greatest impact. To appreciate what these moments might look like, here are a few examples:

- Amazon has a customer intimacy strategy based on using IT analytics to create personalized offers and services. Three key moments of engagement in its strategy are:
  1. **E-mail promotions** that present offers that its analytics have determined are most likely to appeal to you.
  2. **Real-time up-selling** that presents additional offers to you every time you put a product in your shopping cart or on your wish list.
  3. **Shipment tracking alerts** that keep you apprised of your order’s delivery status until it is safely in your hands.

- Contrast the above with Apple, another consumer icon, but one whose strategy is focused on product leadership more than customer intimacy, or what its CEO Steve Jobs likes to call “insanely great products.” Its key moments of engagement include:
  1. **Your first impression of the product**, be that through an ad or an in-store encounter, which is why Apple’s ads are so gorgeous and why its stores look more like exploratoriums than retail sites.
  2. **Your first product question**, which is answered by a knowledgeable sales associate who is deeply familiar with the Apple product line.
  3. **Your first software purchase**, which is “insanely easy,” by virtue of integrating iTunes and the App Store directly into the product.

- Now let’s contrast both of the above, which are focused on B2C markets, with a strategy that is focused on B2B relationships. Here we will use Cognizant as an example. Three of our core moments of engagement are:
  1. **Project commits**, where we make sure with our Two-in-a-Box management structure that we understand the request clearly in the customer’s terms, and we have the capacity and capability to fulfill that request on spec, on time and on budget.
  2. **Solution finding**, where we are able to leverage our Cognizant 2.0 system of engagement to tap into both the wisdom of experts and the wisdom of crowds.
3. **Problem escalation**, where we leverage technologies like telepresence to meet face-to-face (virtually) to address mission-critical issues in real time.

Since core is unique to every company – at least relative to its direct competitors – each enterprise’s moments of engagement represent a kind of signature for its strategy. Excelling in these moments is the most effective and efficient way for a company to communicate its strategic positioning and capitalize on its competitive advantage. So, with that in mind, how exactly do systems of engagement help?

Systems of engagement empower people present in the moment of engagement. They do so by extending their reach across the entire enterprise and its ecosystem of partners to bring the best resources and most up-to-date information to bear on the issue at hand. Examples include:

- An enterprise Facebook that allows colleagues across the enterprise (including partners and customers) to publish their expertise and allows the community to validate it.

- An enterprise Google that lets people search secured databases in conjunction with accessing public ones.

- An enterprise Wikipedia that lets corporations make their core IP readily available to their own teams without exposing it to competitors.

- An enterprise YouTube that lets technical managers explain complex topics via a medium that is compelling and effective.

- An enterprise Twitter that lets people in crisis situations keep the enterprise abreast of late-breaking news.

A key point to reiterate with these five suggestions is they must be tied to your core processes. Implementing social tools in the absence of process (what we call “giving Facebook to the kids”) is mildly productive, today’s equivalent of giving Windows users their Solitaire game so they could learn how to use a mouse. The adoption of these approaches, and the new levels of business value, come from doing meaningful work – via your core processes – with new approaches and new tools.

All systems of engagement have the goal of increasing the reach and the bandwidth of communication and collaboration. The problem they pose for IT leaders is that they do so in ways that challenge enterprise commitments to confidentiality, security, brand protection, liability avoidance, regulatory compliance and the like. This is why the business world is still in stage 1 of the technology adoption lifecycle.

To make the first steps forward, IT initiatives must be highly focused and enthusiastically sponsored. The focus will ensure they provide exceptional capabilities in the core moments of engagement, thereby ensuring a high return for the increased level of risk they entail. And committed executive sponsorship will ensure they don’t get bogged down negotiating for the innumerable exceptions needed to see the light of day. Stage 1 is no time to “major in minors.” This is a time to either go all in or fold and wait for another hand to play.

For at the end of the day, IT initiatives in stage 1 of the adoption lifecycle are a bet. Your job is to make sure a) the bet is worth making and b) you are doing all you can to risk-reduce the effort.
Embracing Systems that Think

Corporate IT is about to experience a renaissance. Our rationale: Not only will IT erect the foundational infrastructure for Enterprise 2.0, but it will also act as the company's central nervous system, once it's up and running. The keys to this transition will come from focusing finite IT resources on virtualization of the organization and bringing consumer IT technologies and principles to the enterprise. In short, corporate IT needs to make the Monday morning computing experience not only equal but superior to the personal Sunday evening computing experience. For the past 20 years, corporate IT has succeeded (on average) in implementing a highly functional backbone of operational systems. These, in short, are systems that “do” (for as systems of record, they have simple inputs and outputs). For the next decade, corporate IT needs to shift its focus to putting in platforms of collaboration that, in the context of knowledge processes, will become systems that “think.” The key is in putting these systems of engagement in place in a “crawl, walk, run” manner. First, introduce social technologies in a fairly vanilla manner, one that employees will recognize from their personal lives but are architected and implemented in an organizational context. Second, begin to marry these social platforms with key knowledge processes. Third, once the system of engagement becomes the default location for process execution, the overall organizational model can be revamped to support this new operating reality. Through such steps, Enterprise 2.0 starts to take form.

Building the Future of Work, Today

The Great Recession will be remembered as an important “shift point” as the four forces of globalization, virtualization, cloud computing and the millennial generation begin to greatly change the fortunes of individuals, corporations and even whole societies. As a senior manager, it’s incumbent upon you to understand these shifts in the context of your industry and your organization in order to build a next-generation workplace. As the old expression goes, “When it comes to the future, there are three kinds of people: 1) Those who made it happen, 2) those who let it happen and 3) those who wonder what happened.” Hopefully, with some of the perspectives in this white paper, you will safely be out of the third category. The opportunity – and the hard work – is now in making it happen.
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Footnotes
2 http://www.pri.org/business/middle-class-booms-in-india-china2400.html
3 Gartner Group, IT Priority studies, 2008, 2009, 2010
4 http://online.wsj.com/article/SB122680388282631287.html?mod=googlenews-wsj
Complexity and the Adoption of Innovation in Health Care

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for

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Complexity and the Adoption of Innovation in Health Care

Paul Plsek

Simple, Complicated and Complex Issues

Innovation in health care is not a complicated issue. It is a complex issue. Glouberman and Zimmerman (2002) illustrate important distinctions between simple, complicated, and complex problems.

- Baking a cake is a simple problem. Simple problems lend themselves to a recipe approach. The process and results are generalizable; and while special skill at cooking is a plus, it is not essential for success.
- Sending a rocket to the moon is an example of a complicated problem. Complicated problems are best dealt with using formulaic and expert-knowledge approaches. The overall problem can be mechanistically broken down into component parts (booster rocket, cabin environment, navigational equipment, etc.) and assigned to teams of experts who utilize the proven methodologies of their disciplines. Rockets are similar in important ways, meaning that success with one rocket provides reasonable assurance of success with future rockets. When surprising events do occur, we can study these, build improvements into the system, and thus raise the probability of future success.
- In contrast to simple and complicated issues, an example of a complex issue is that of raising a child. Success in raising one child is no guarantee of success in raising another. Past experience, coupled with advice from experts, can serve as a starting point; but we know that simply applying the formula that worked before may not lead to success, and may even lead directly to failure because of the second child’s resentment at being treated this way.

While the public generally marvels at the scope and pace of innovation in high-profile medical technologies, there is less praise about innovation in basic clinical, business, and service delivery processes. We routinely take the latest medical technologies of the 21st century and embed them within a service delivery and patient flow process—with its appointments, waiting rooms, and so on—that has remained fundamentally the same since the 1950s.

Despite sincere attempts in recent years to spread innovation through the mass dissemination of knowledge and expertise (a complicated approach to the problem) our experience with the spread of innovation in health care often seems to have more in common with the occasional pleasant surprise and unpleasant frustration associated with raising children.

In this paper we will examine what it means to say that health care is complex and how that complexity affects the generation and spread of process innovations. While we will offer models and new thinking, our intent is not to carve out new theoretical ground. Rather, the purpose of this paper is to offer practical advice about common challenges. Our premise is that we intuitively know quite a lot about complex systems; just as we intuitively know quite a lot about what is likely to work and not work in raising children. Unfortunately, many of the instinctive actions of leaders in the health care system who are trying to meet the challenges of innovation are not well informed by what we know about complexity.
Health Care as a Complex System

Health care organizations can be viewed as complex systems (Institute of Medicine 2001; Plsek and Greenhalgh 2001; Sweeney and Griffiths 2002). A complex adaptive system is a collection of individual agents who have the freedom to act in ways that are not always totally predictable, and whose actions are interconnected such that one agent’s actions change the context for other agents. Examples include the immune system, a colony of insects, the stock market, families, and health care organizations.

The study of natural and human complex systems has revealed important properties that help us better understand these systems. Some properties that are potentially relevant to our understanding of innovation in complex systems are described below.

**Relationships as central to understanding the system.** The behavior of a complex system emerges from the interaction among the agents. The observable outcomes are more than merely the sum of the parts. For example, a collection of highly competent professionals with poor interactions is likely not to provide as good care as the same skilled individuals with better relationships. Lane and Maxwell (1996) describe “generative relationships,” in which the interactions among parts of a complex system produce valuable, new, and unpredictable capabilities that are not inherent in any of the parts acting alone. Surprising and innovative ideas can emerge from unpredictable corners of a complex system that fosters diverse relationships among the parties within the system.

**Structures, processes, and patterns (SPP).** We can describe complex systems by their structures, processes, and patterns. (Capra 1996, 2002) These three ways of seeing the system are highly intertwined and interacting. For example, we might change the structure of the medication administration system in a hospital by implementing a computerized medication order entry system; but unless we integrate this with real changes in the process of ordering and dispensing medications, medication administration may not be transformed. Further, we must acknowledge the patterns within the system and make integrated changes in these as well. In a complex human system where individual agents have freedom, patterns of relationships, beliefs, traditions, power, conflict, fear, blame and so on are as much a part of the system as are the structures and processes. Ignoring these, or wishing them away, is shortsighted and inappropriate in a complex system.

**Actions based on internalized simple rules and mental models.** In a complex adaptive system, agents respond to their environment using internalized rule sets that drive action. In a biochemical system, the ‘rules’ are a series of chemical reactions. At a human level, the rules can be expressed as instincts, constructs and mental models. “First, do no harm” is an example of an internalized rule that might be behind an individual’s reluctance to embrace the risk of an innovative change. These mental models need not be shared, explicit, or even logical when viewed by others, but they nonetheless contribute to the patterns in the complex system. Importantly, as a recent Institute of Medicine report on the need for fundamental change in the US health care system has noted, deliberately surfacing and changing underlying simple rules leads directly to innovative ideas. (IOM 2001)

**Attractor patterns.** A related idea from complexity science is the notion of underlying attractor patterns in the system as an explanation for otherwise complex behavior. Consider an innovation advocate who is baffled by the fact that some innovations are taken up quite naturally by members of a certain professional group, while other seem to be actively resisted despite rigorous evidence for their effectiveness. A more insightful look might reveal that ideas that support this professional groups’ autonomy and that enhance their image with patients are embraced, while those that are believed to be counter to these desires are not. Desire for autonomy and enhancement of professional image are attractor patterns in the complex behavior of this group in response to issues.
As with simple rules and mental models, these attractor patterns might not be logical when viewed by others, but they are a part of the complex system that cannot be ignored.

**Constant adaptation.** The elements of a complex system can change themselves. Examples include microorganisms that become antibiotic resistant, or a person who learns. This ability to adapt is the explanation for both the innovative change in one part of the health care system, and the remarkable resilience in another part of the system that maintains the status quo no matter what happens around it.

**Experimentation and pruning.** Evolution of species in Nature relies on two processes: (1) processes that generate variation and (2) processes that prune the resulting evolutionary tree. (Holland 1995) Likewise, human systems that evolve and progress need structures, processes, and patterns that support experimenting with new ways of doing things, as well as those that aid in providing feedback on the effectiveness of these new ways. Paradoxically then, a system that supports innovation must both allow ideas to go forward in the absence of evidence, and be steadfast in insisting on evidence of effectiveness for evaluation.

**Inherent nonlinearity.** In a complex adaptive system, small changes can have large effects, while seemingly large changes might have little effect. For example, a major change management program in an organization might have little real impact, while a conversation among two old friends at a conference might lead one to go back and implement a major change in a clinical process. It is difficult to predict where the nonlinear change points might be within the system, but they are often found embedded in simple rules, seeming paradox, and generative relationships. Nonlinearity gives us hope in bringing about change.

**Systems are embedded within other systems and co-evolve.** The boundaries of a complex system are somewhat arbitrary. We can say that a medical group is a complex system, which is embedded within a regional health care system, which is embedded within a national health care system, which is embedded within a political system, and so on. The evolution of each of these complex systems influences, and is influenced by, that of the other systems. At another level, we can also distinguish between formal and informal systems. Our efforts to innovate within the formal system of medical care, defined by hierarchical relationships involving bosses and subordinates, can be aided or thwarted by interactions within more informal “shadow systems” (Stacey 1996) involving friends and colleagues discussing matters around a lunch table. Again, ignoring or wishing away this reality of complex systems is shortsighted.

We will use these concepts from the science of complex systems to generate practical insights to enable better thinking about the spread of innovation in health care.

Before we move on, however, we must acknowledge that many of these complexity concepts seem intuitively obvious. Why, then, are we not already using approaches to innovation in health care that are informed by them? The answer lies in the underlying mental model of organizations as machines that came to us with Fredrick Taylor’s “scientific management” at the dawn of Industrial Age. (Taylor 1911) We are exercising this mental model when we approach an issue as a complicated task, or when we speak of an organization that functions “like a well-oiled machine.” In a machine, the designer dictates the relationships among the parts, patterns are a deterministic function of structures and processes, and any “emergent behavior” would be a failure of the system that we would want to militate against in the future. We suggest here that much of our current frustration around adoption of innovation within the health care system is a consequence of our largely unconscious application of machine-metaphor thinking to what is inherently a complex adaptive system.
Model for Thinking about Innovation in Health Care

Figure 1 presents a useful model for thinking about the complex issues associated with innovation in health care systems. Within the health care system, we can conceptualize three interrelated processes of generation, implementation, and widespread adoption of innovative ideas. The generation process involves creative thinking that leads to the birth and initial pilot testing of an innovative clinical, business, or service delivery process idea. Implementation refers to the processes and challenges associated with putting a concept into action and embedding it into the day-to-day routine within a health care organization. The spread process involves those things that we do (or fail to do) that accelerate (or impede) the adoption of the new practices across many organizations, and eventually throughout the entire health care system. While creative thinking and adaptation are most naturally considered in the generation of an innovative idea, further creative development and enhancement of the idea also occurs during local implementation within an organization, and as the idea spreads across organizations. (Rogers 1995)

![Aspects of the Adoption of Innovation in Health Care](image)

**Figure 1**: Some aspects to consider in understanding the complexity associated with innovation in health care.

From the point of view of an individual organization regarding a specific innovation, these three processes can play out singly or multiply, and in any order. For example, an organization might be the initial generator of an innovative service delivery concept, go on to implement that concept into its routine, and then participate in industry-wide efforts to spread the idea (for example, through presentations at national conferences). Another organization might take part in the spread process by sending a team to the national conference, with the team returning home to adapt the innovation for local implementation. A team from another organization at the conference might choose to reject the idea after learning more about it (thus ending the adoption process), while a third team might have been stimulated to think creatively about service innovations in some other aspect of health care delivery. We should also note that it sometimes happens that the innovator (vendor, consultant group, etc.) who comes up with a new concept goes immediately into the spread process without first generating a successful implementation of the idea in a single organization. We will say more about how complexity impacts each of these three processes in subsequent sections.

These processes associated with innovation take place within a context that involves the structures, processes, and patterns of the organizations that make up the health care system.
Pettigrew and colleagues (1992) used the phrase “receptive context” to describe the degree to which a particular group or organization naturally takes on change and new ideas. Organizations with a high receptive context are seen as “ripe” for change; they quickly adopt innovative concepts in order to meet the challenges they experience. Other organizations with low receptive context might experience the same challenges and learn about the same innovations, but they lack the will or ability to implement the idea. Lack of understanding about the important role of organizational context, or unwillingness and lack of skill in doing something to make it more receptive, leads to much of our current frustration with the relatively slow and uneven adoption of innovations in healthcare. We will return to this point in a later section.

The health care system is, of course, embedded in larger societal, industrial, and political systems that influence the pace and spread of innovation. While there are myriad links among all these co-evolving systems, we will consider only two important ones here: the flow of knowledge and the nature of influencing forces.

Fresh knowledge is the seed from which innovation arises. For example, breakthroughs in knowledge about the human genome are sure to yield innovative treatments for many diseases in the future. The key to whether knowledge will lead to innovation lies in the “freshness” of the knowledge within the context that it is being applied. For example, our traditional mental models (one form of knowledge) about patient flow in a primary care clinic lead us to design new clinic facilities with parking lots, reception desks, and waiting rooms. When we open up our thinking to receive “fresh knowledge” from outside the healthcare system about customer flow, we may notice the concepts of drive-through windows in the fast food industry, or Internet-based services in banking. This fresh knowledge might feed a creative generation process that results in ideas about how drive-through windows and Internet sites might be used to serve patients in a new primary care clinic. Such an adaptation of common-knowledge ideas from outside the healthcare system would be considered innovative within the healthcare system.

The health care system influences, and is also influenced by, other larger systems. For instance, advances in medical care over recent decades that have yielded quicker returns to work have no doubt influenced productivity measures in general industry. In turn, the purchasing power of general industry is influencing the direction and pace of innovation in the US healthcare system through such things as the endorsement of computerized order-entry systems by the Leapfrog Group (a coalition of large employers). Regulation, legislation, and political pressures are other obvious examples of external forces that impact innovation in healthcare. Christensen and colleagues (2000) provides a striking example of how powerful industry, professional, and regulatory forces can bring to an absolute halt the spread of a new medical technology; in this case, a portable, low-intensity X-ray machine based on nanocrystal technology and night-vision concepts borrowed from the military. In the National Health Service in England, massive government funding for “modernisation” projects has brought about innovative improvements in care for literally millions of patients in primary care, cancer care, and a host of other topics.

The model for aspects of adoption of innovation in healthcare (figure 1) allows us to draw the distinctions shown in figure 2 between complicated-problem approaches, which are based on a machine-metaphor and have not been as successful as we might have wished, and approaches based on a better understanding of complex systems.

We will now look deeper at how complexity-inspired approaches might lead to potentially more productive activities in several dimensions of the innovation model in figure 1.
Approach the innovation issue as:

<table>
<thead>
<tr>
<th>Complicated</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying metaphor</td>
<td>Organization as a machine; Plan and control</td>
</tr>
<tr>
<td>Generation of ideas</td>
<td>To be done by creative specialists and experts</td>
</tr>
<tr>
<td>Implementation of ideas within an organization</td>
<td>Should be thoroughly planned out and be primarily a replication of structures and processes that have worked elsewhere</td>
</tr>
<tr>
<td>Widespread adoption across organizations</td>
<td>Primarily an issue of evidence dissemination and motivation</td>
</tr>
<tr>
<td>Receptive context for change</td>
<td>Health care organizations are largely similar and there are a small number of key issues that we must address to assure success</td>
</tr>
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**Complexity in the Generation of Innovative Ideas**

Innovative ideas are the products of creative minds. Consistent with the notion that complex systems are embedded within one another, the minds of the individuals who work within the health care system are also complex adaptive systems. (Goertzel 1993) Because of its complex adaptive nature, the mind has the wonderful capacity to connect and rearrange knowledge to generate new and useful ideas. (de Bono 1967; Plsek 1997) For example, we know that elderly patients sometimes forget the details of the medication regimen that the doctor has discussed with them. We also know that a tape recorder can record conversation for later playback as a reminder of what was said. Further, it is common knowledge that a standard telephone-answering machine has a tape recording mechanism within it. A creative connection among all this knowledge would be to suggest that the doctor get the elderly patient’s consent to dial his or her home telephone number, and then allow the doctor to use the answering machine to record the conversation that is about to take place regarding the medication regimen. The patient can then listen to the message again when he or she returns home. Research indicates that this capacity for creative thought via connections among what we already know is an ability that we all possess. (Weisberg 1993)

Plsek (1999) has demonstrated that otherwise ordinary clinical and administrative staff in a large health maintenance organization can generate wonderfully innovative ideas for clinical and service delivery processes. Multidisciplinary groups of about 15 persons were invited to attend a 1.5-hour workshop offered over lunch at three clinic sites. Following a short presentation about creative
thinking, participants broke up into smaller groups of 3-5 persons and used a variety of idea-generation tools to think about portions of the typical patient-flow process in a clinic. With minimal training and under severe time constraints, these multidisciplinary groups generated a total of 74 innovative ideas. The idea above about using the patient’s telephone answering machine to record the doctor’s medication instructions was once such idea.

Anecdotal reports from similar work in other health care settings, coupled with evidence on the use of creative idea-generation tools among individuals and groups in other industries, suggests that this experience is far from unique. We suggest that the potential exists within the health care workforce to generate orders of magnitude more innovative ideas for clinical, business, and service delivery processes.

The structures, processes, and patterns associated with innovation in other industries are much more supportive of creative generation of improvement ideas than are those in health care. For example, the fact that 3M Corporation holds senior managers accountable to generate one-third of their division’s annual revenues from products that did not exist three years ago creates an emphasis on encouraging and nurturing creative ideas from all employees. Many industrial corporations earmark between 2-10% of total budget each year to support a formal research and development (R&D) function. (Van de Ven et. al. 1999) These corporate R&D labs are not only concerned with basic or product-specific research, but also engage in research on innovative manufacturing, information systems, and service delivery concepts. In contrast, few health care organizations outside academic centers have any budget or formal structures that could be classified as an R&D function. While vast sums of money go into health care research, much of it is directed into basic sciences and clinical research.

A basic R&D function within a health care organization might provide workforce-wide training for creative thinking, and also facilitate specific innovation projects along the same lines as today’s quality improvement efforts. This local R&D function might further surface existing simple rules that lie behind current approaches to clinical, business, and service delivery processes in much the same way that the IOM report has done. (IOM 2001) In addition, the new function might look directly at the nature of generative relationships and aspects of receptive context in the organizational culture. Clearly, the function would evolve over time, but the main point would remain to tap the creativity inherent in the health care workforce and maintain a constant focus on innovation as one of the core competencies of any health care organization.

**Complexity and the Implementation of Innovative Ideas**

The 18th century German philosopher Goethe noted, “To put your ideas into action is the most difficult thing in the world.” One of the by-products of the complexity of health care organizations is their remarkable resilience in the face of pressure; even when that pressure is one for positive change.

A decision to change is ultimately made by individuals in a complex system according to personal mental models about such things as the benefits and risks associated with the change. Even when others with position-power within a hierarchy believe that they can mandate change, individuals often retain their own rights to decide for themselves how they will react. For example, a hospital administrator can decide to mandate the implementation of a computerized order entry system, but individual physicians will decide whether they will use it, or continue with old-fashioned handwritten orders. The administrator can further mandate that the pharmacy will no longer accept handwritten orders, but individual physicians can respond by passing the order-entry task to clerical
staff and thereby minimize the benefits that were supposed to be associated with the various computerized reminders and prompts (e.g., potential drug interactions) that are built into the system. The point is that in a complex system such as health care, where individuals maintain quite a bit of freedom to act autonomously, coercive strategies for implementing change are of limited value. Further, the use of a coercive strategy on one topic damages relationships and can result in attractor patterns of future behavior that play out as general resistance to change.

Much has been said about so-called “resistance to change.” It is interesting to note that the very term “resistance” invokes a mechanical metaphor. Goldstein (1994) has noted that when we understand individuals and groups as complex systems, the concept of attractor patterns “…turns the concept of resistance to change on its head.” As we have noted, in a complex system, adaptive change is naturally occurring. Change is not so much about overcoming resistance as it is about understanding and working with natural attractor patterns in the system. (Plsek and Kilo 1999)

A common attractor pattern for most of us is the preference for ideas that we feel we were involved in generating. The encouragement for creative thinking and the support for an R&D function in all health care organizations described in the section above can create wider-scale involvement in innovation, which can aid implementation.

As previously noted, evolution and change in large, complex systems comes about through massive testing and pruning of possibilities. The rapid-cycle test-of-change improvement methodology, advocated principally by the Institute for Healthcare Improvement, is already widely used to support change efforts in health care organizations. (Berwick 1996, 1998) Horbar and colleagues (Horbar et. al. 2001; Plsek 1999) have taken this methodology a step further in advocating for the establishment of the “habit for change” in neonatal intensive care units (NICUs). They encourage NICUs in a multi-organizational collaborative improvement program to make small-scale changes across a wide variety of topics. Reports from this group indicate that these health care units are able to implement change ideas that they themselves participate in generating, as well as those originally generated by others. NICUs in this collaborative group have demonstrated significantly improved performance when rigorously compared to similar NICUs who have not used the methodology to establish a habit for change. (Horbar et. al. 2001)

The rapid-cycle test-of-change model helps in a variety of other ways when it comes to the implementation of innovation in a complex system such as a health care organization. For instance, it allows advocates of innovation to test their ideas under a variety of circumstances, thus allowing for adaptation. The model also include the possibility that the test will not be successful; but because the test is done on a small scale the risk of failure can be kept to a level that matches the tolerance of those who must be involved. Further, success on a small scale builds confidence that allows larger risks as time goes by.

**Complexity and the Spread of Innovation**

While the generation and implementation of innovative ideas has its challenges, the issues around the spread of innovation are often the most frustrating. Here we begin with an idea that has already been generated, tested, and implemented to deliver a benefit to patients or health care professionals. Yet despite this evidence of effectiveness, the idea does not become universally implemented across all health care organizations.

The mechanistic model of health care organizations drives some innovation advocates to coercive-power approaches for spreading change. The very metaphor of “spreading innovation” suggests that a pushing or driving force, with its own agenda and power, is behind the idea. The
natural reaction in a human social system to such a push is to push back and assert individual autonomy.

It may be more helpful to think of the spread of ideas as the result of an individual- or group-decision _adoption_ process, not the other way around. (Fraser and Plsek _in press_) Our understanding of complex human systems is that ideas spread naturally through social contact and networks, in which individuals and groups are enabled to frame their own needs and interact on their own terms with others who might have ideas that fit those needs.

The importance of social networking for the spread of innovation has been demonstrated in formal evaluations of large-scale change efforts in the UK. The National Primary Care Development Team reported that over a 2-year period just under 2000 practices covering almost 11.5 million patients were engaged in collaborative sharing of innovative ideas that yielded, among other outcomes, a fourfold reduction in mortality for patients with coronary heart disease and a 60% reduction in the average waiting times to see a GP. Similarly, an evaluation report on the UK Cancer Services Collaborative concluded:

> “Engaging and involving the whole team in planning and implementing new practices facilitates both spread of new initiatives and sustainability. Engaging clinicians is especially important… Dedicated time for people to meet, reflect and discuss is required both to facilitate spread and in order to sustain ongoing improvement.”

In his observational studies of the diffusion of innovation, Rogers (1995) noted that certain individuals in the social system seemed to have more influence than others when it came to the spread of ideas. Rogers dubbed these individuals “opinion leaders” and noted that they tended to be either among the early adopters of an idea, or among the most influential critics of it. Valente (1995) has developed network models of this phenomenon. Noting that complex systems have nonlinear characteristics, we should not be surprised at these findings.

The actions of organizational leaders and advocates of particular innovative ideas are not always consistent with these findings, however. For example, so called “consensus-driven cultures” in some health care organizations and efforts to seek “buy-in from all involved in change” are seemingly built on an underlying assumption that everyone is equal in their influence for change. In contrast, pharmaceutical companies consider the identification and targeting for special treatment of the opinion leaders in a geographic area or medical specialty a natural part of the marketing process to gain widespread use of their new drug.

Green and Plsek (2002) report the use the opinion leader research by senior leaders and process teams within a health care improvement collaborative whose purpose was the spread of innovative practice across a variety of clinical, business, and service delivery processes in the upper Midwest region of the US. The author has also led groups of senior leaders from member organizations of VHA Inc. in identification of local opinion leaders to help spread innovative practices that lead to higher levels of patient safety.

It should be noted that the use of opinion leaders to spread ideas is not new. It has been studied in many health care settings. Unfortunately, its deliberate use has remained largely in the context of formal research studies. Few organizational leaders consider the rigorous identification of opinion leaders within their organizations to be a standard management practice; which is what we are suggesting here. Oddly, there is anecdotal evidence from the Green and colleagues’ improvement collaborative cited above that when formal opinion leader research has been conducted, some senior leaders are strangely embarrassed about using the results. Issues that arise include what to do about someone who thinks that they are an opinion leader, but their colleagues do not see them as such.
The inability to handle the potential interpersonal conflict that might arise causes some organizational leaders to fall back to the default positions of “treating everyone equal and getting everyone’s buy-in” even though they know that this is not consistent with how complex social systems function.

There is an important caution here. Opinion leadership among professional colleagues can be a very fragile commodity. There is anecdotal evidence that, for example, appointing an opinion-leading physician to a formal post such as vice-president for medical affairs within a hospital can actually diminish that individual’s credibility with peers over time. This is not so surprising an emergent outcome when we see the social system as a complex adaptive system. As noted previously, complex social systems have both a formal structure (with such things as titles and hierarchy) and an informal “shadow system.” This shadow system can sometimes be even more powerful than the formal system; and it would seem likely that this would be the case among highly autonomous professionals such as those in health care.

Receptive Context for Change in Complex Systems

The activities of innovation and change that we have been discussing take place within a variety of organizational contexts. While it is possible to make some general statements about the nature of the context for change across the US health care system, each organization is different in many important ways. Just as with raising children—where we might make general statements but we know that each individual child can be very different—the context for change is yet another aspect of the complexity associated with bringing about innovation in health care.

While we intuitively know that the context for change is different in each organization, this insight does not fit well with our inherited mental models from health care research about how we should study various phenomena. For example, when we test the effect of a new drug we select a relatively homogeneous group of patients as a research sample, and are then able to generalize the results. Since human body physiology is not so different for the majority of people in a population, if the new drug is effective for this sample of patients, then it is reasonable to assert that it is effective overall for the general population. When it comes to an intervention in a health care organization, however, we must recognize that the “physiology” (the context) of organizations can be quite different and, therefore, we need always to question the generalizability of findings. This caution should not keep us from rigorously studying the effects of innovative change ideas. Rather, it should keep us from silly mistakes such as expecting that an innovation that was successful in one place will be successful in other places if only “they would just follow the model provided.”

The notion of context in complex systems would also suggest that if the goal is the spread of an innovation, it is not sufficient to describe only the innovation. We must also develop a language for describing the nature of the context in which it was successful. The “kit” for spreading the idea (for example, articles, presentations, guidance booklets, conferences, improvement collaboratives, etc.) should include advice on assessing, and perhaps modifying, key elements of organizational context relevant to the innovation. Developing such advice will require an added level of sophistication in the social sciences from innovators, researchers, advocates of spread, and organizational leaders at all levels.

Most advocates who have tried to spread an idea have heard local leaders comment, “Yes, I see how it worked there, but, we are different.” The advocate’s response to this comment is generally to try to get the other party to see that they are not so different. Since change requires the assent of these local leaders, if they believe that they are different, they win the argument by default as they will then make little effort to implement the idea. This is both very frustrating for change advocates, and very common. A complexity-inspired approach to the adoption of innovation would react
differently to the initial comment. A more appropriate response might be, “Yes, of course, you are different; as is every organization. Can we discuss what you think are the key differences in your context relative to what we experienced about ours, and can we think creatively about how we might adapt the ideas to address your context?”

One important and complex aspect of context is how individuals within health care organizations feel about innovation and change itself. The simple rule “First, do no harm” is, appropriately, deeply embedded in the psyche of nearly everyone in a health care organization. This sets up a generally conservative approach to change, especially change that is based on a new and innovative idea that may not have a long track record. This ethic may cause health care professionals to unconsciously overestimate the potential risks associated with an idea for change. Dialogue toward a realistic assessment of the risks associated with a new way of doing things should accompany all attempts to implement and spread innovation. “Realistically, what is the worst things that can happen and how could we manage that?” is a good way to start the discussion.

Each topic we approach may have additional simple rules and mental models from the past that are pervasive within a given context. For example, spread of the service innovation of eliminating long queues and offering same-day appointment access in physician office practices will be difficult in a context in which the unstated simple rule is, “You can tell the best doctors by how long you must wait to be able to get in to see them.” We will need to address explicitly this pattern of thinking embedded in the context if we hope to be successful in getting adoption of the new idea. The recent Institute of Medicine report (2001) identifies several current simple rules that exist in many organizational contexts and that seem to maintain the relatively poor status quo performance of the health care system, along with suggested new simple rules that might lead to better performance. Silversin and colleagues (Silversin and Kornacki 2000; Edwards et. al. 2002) report on the success of a large-group dialogue process for health care professionals that constructively surfaces and examines beliefs that make up the context underlying efforts at change. The positive and constructive use of dialogue to begin changing the context in organizations has been studied in many settings. (Senge et. al. 1994; Watkins and Mohr 2001)

The author’s personal experience in working with health care organizations, combined with a review of classic organizational development literature dating back to the 1920s as modern organizational structures were emerging, (Graham 1995) suggests that five key elements of organizational context that can have a large impact on receptivity for change are:

- The nature of relationships; how they are built and maintained.
- The nature of decision-making; how is it done and by whom.
- The nature of power; how is it acquired and how is it used.
- The nature of conflicts; how do they arise and what are the common forms of dealing with them.
- The importance placed on learning; both individually and collectively.

A better understanding of the nature of receptive context is emerging from research into specific attempts at change and the spread of innovation. Figure 3 shows findings from a few selected studies indicating the types of elements that are cited as key aspects of the context.

There are, of course, some patterns across these studies in the frequency of mention of things like clear goals, openness to change or risk, and strong leadership. Note also, however, the variety of factors cited and the variation in depth of study and language used to describe what was observed. Clearly, we lack a consistent methodology and taxonomy to describe the phenomenon of receptive change. Further, as noted previously, we do not know whether any of these findings are generalizable. Would the same factors be found in other organizations if the studies were repeated?
Would the same factors be identified in these same organizations if the topic were different (improving patient satisfaction versus use of beta-blockers)?

We are just beginning to understand receptive context and its relationship to issues around the generation, implementation, and widespread adoption of innovative change. Much more research is needed, with the goal of creating practical tools and advice for organizational leaders.

We need not wait, however. Even an intuitive, empirical, and emergent approach that recognizes the importance of context when making change is better than what is often currently done in insisting on “one size fits all” approaches to change.

**Figure 3.** Factors identified as key in a receptive context for change.

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting/Topic</th>
<th>Identified key factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortell et al. (1998)</td>
<td>Review of literature on CQI efforts in health care in US</td>
<td>Clear strategic goals&lt;br&gt;Openness to change&lt;br&gt;Collaboration and teamwork&lt;br&gt;Learning from mistakes&lt;br&gt;Availability of training and information support systems&lt;br&gt;Structures to facilitate learning and sharing&lt;br&gt;Structures to disseminate ‘best practices’ widely</td>
</tr>
<tr>
<td>Bradley et al. (2001)</td>
<td>Rates of beta-blocker use in AMI patients discharged from US hospitals</td>
<td>Shared goals for improvement&lt;br&gt;Substantial administrative support&lt;br&gt;Strong physician leadership advocating for this specific change&lt;br&gt;Use of credible data feedback</td>
</tr>
<tr>
<td>Pettigrew et al. (1992)</td>
<td>Large-scale strategic change initiatives in health districts in the UK</td>
<td>Quality and coherence of policy (the change itself)&lt;br&gt;Simplicity and clarity of goals&lt;br&gt;Availability of key people leading the change&lt;br&gt;Intensity &amp; scale of long-term environmental pressure&lt;br&gt;Culture characterized by flexible working across boundaries, openness, risk-taking, strong values base, and strong positive sense of achievement&lt;br&gt;Fit of change agenda to locale&lt;br&gt;Managerial-clinical relationships&lt;br&gt;Cooperative inter-organizational networks</td>
</tr>
<tr>
<td>Ham et al. (2002)</td>
<td>Multi-organizational quality improvement effort to improve access to acute care services in the UK</td>
<td>History of working on the topic&lt;br&gt;Clear and strong leadership&lt;br&gt;Political commitment to the topic as a priority&lt;br&gt;Culture characterized by communication, involvement, creativity, and learning by experimentation&lt;br&gt;Good relationships&lt;br&gt;Flexible use of methods&lt;br&gt;Resources and capacity to support change&lt;br&gt;IT support&lt;br&gt;Willingness to address changes in roles&lt;br&gt;Willingness to fundamentally redesign processes</td>
</tr>
</tbody>
</table>

Working Positively With Complexity: Summary of Key Ideas and Five Recommendations for Aiding the Adoption of Innovation in Health Care Systems

This brief paper only touches the surface of the implications for thinking about innovation when we understand health care as a complex system. Because we have an intuitive appreciation of complexity as it manifests itself in other aspects of our lives (e.g., raising children), many of the ideas here might seem to be common sense. But because our learned models about how organizations ought to work are based on machine-metaphors and complicated approaches to issues, many of the ideas here do not necessarily represent what is common practice. As the examples in the first column of the table in figure 2 illustrated, we have strong tendencies to favor plan and control approaches, believe that innovative thinking is a relatively rare expertise, focus on structures and processes only, feel that dissemination of evidence and motivation is all that a rational person should require in order to change, and think that the factors necessary for change are not so different across organizations. When we accept the notion that health care organizations are complex systems we must take a different view. Understanding complexity we know that:

- we must learn and adapt as we go along
- innovative ideas can come from anyone in the health care workforce
- while we can be informed by what worked elsewhere, we must take account of local conditions when implementing change
- patterns of thinking and behavior are just as much a part of the systems as are structures and processes
- spread is the result of the adoption process; not the other way around
- spread of innovation is primarily an issue of knowledge sharing through social networks
- there are nonlinear patterns in the social network that make some individuals more essential than others to the spread of innovation
- the organizational context with regard to change can differ across organizations, and this matters

These understandings from the study of complex systems lead to some recommendations for action for those interested in the more effective adoption of innovation in health care. In offering these ideas, we are mindful of not wanting to fall into the very trap we warn against: reducing an inherently complex set of issues down into a formula. Therefore, we present these “recommendations” as initial ways of thinking about and approaching the issues, rather than some sort of definitive therapy. We believe that interventions such as the ones below provide an opportunity for new behaviors to emerge from within the complex system itself. Next steps beyond these are unpredictable at this point and will have to follow on based on observation of what happens.

- **Recommendation:** Eschew mechanistic and coercive approaches.
  **All parties** interested in the issues of adoption of innovation should review their thinking and past approaches and question the extent to which they are built on mechanistic or coercive models. Mechanical, complicated approaches will see only limited success. Coercion should be used only very selectivity, and only on inappropriately entrenched, self-serving interests.
Recommendation: Establish health care process R&D functions pervasively.

Senior leaders of health care organizations should follow the lead of their counterparts in other industries in establishing and funding out of operating revenues a process R&D function within their organizations to focus on innovation in clinical, business, and service delivery processes. The goals of such a function should include setting up means to engage the natural creativity of the entire health care workforce and building a receptive organizational context for change, as well as generating specific, innovative change ideas. Government, professional organizations, and funders should consider setting up national or regional centers and innovation think-tanks. A recent IOM report recommended the establishment of a $1B health care innovation fund that is along the same lines as that proposed here.

Recommendation: Devote considerably more attention and effort to social networking in health care as being essential to the goal of spread of innovation.

Senior leaders in health care organizations and professional societies who would like to see acceleration in the spread of innovative practices should become more proactive in identifying and supporting natural social networks and the opinion leaders within them. Structural supports such as protected time for staff at all levels to network, explore for ideas, and test new ways of working are essential for greater spread. Modern, interactive communication technologies should be tapped to allow more individuals with process problems to connect easily to those with potentially useful ideas. The recent announcement by the Institute for Healthcare Improvement and the British Medical Journal of a joint venture to develop an interactive Internet site for such a purpose is an interesting development in the right direction.

Recommendation: Seek to establish a habit for change in health care organizations.

Today in most health care organizations, change is a special effort; a separate project. Senior leaders in health care organizations should ask their organizations to pursue orders of magnitude more rapid-cycle test-of-change on topics of interest across the spectrum of health care processes, with the goal of making change the norm. Health services researchers should aid in this effort by cataloguing the experiences of successful organizations in order to establish a new benchmark in the health care industry.

Recommendation: Develop better language and tools to support the creation of more receptive contexts for change in health care organizations.

Health services researchers and funders should devote considerably more attention to the social sciences for understanding organizational context and its effect on innovation and change efforts. We need a taxonomy, a descriptive language, assessment tools, and advice for health care leaders about how to work directly on these issues. Senior leaders in health care organizations should include goals for organizational development in their strategic plans and governance boards should hold leaders accountable for maintaining a focus on this issue. National advocates for innovation and professional societies should incorporate material on organizational context in all efforts to spread innovation ideas (publications, guidelines, conference, etc.)
We can do much better in our focus on innovation in health care for clinical, business, and service delivery processes. A decade from now it should be commonplace that:

- Staff at all levels feel encouraged to think creatively
- Health care organizations have moved beyond “change as a project” and have established a pervasive “habit for change”
- Health care organizations can boast implementation of hundreds of locally-generated innovations
- Innovative ideas generated anywhere in the health care system spread through the entire system at a speed that rivals that with which innovative ideas that delight customers in other industries spread among competitors
- Most health care organizations have deliberate innovation efforts supported by dedicated R&D resources funded out of operating revenues and considered strategically important to the future of the organization
- National and regional health care innovation centers serve as conduits for ideas to make health care better.
- Other industries come to look at health care organizations for examples of best practices in the area of innovation and change.

The first steps come in recognizing that mechanistic, complicated approaches to the issues of innovation are of limited effectiveness in the complex system that is health care.
References


Fraser SW and Plsek PE. Translating evidence into practice: An externally driven change or a personal transition? Accepted for publication in *Education in Primary Care.* (anticipated May 2003)


A summary of Diffusion of Innovations

Les Robinson

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Diffusion of Innovations seeks to explain how innovations are taken up in a population. An innovation is an idea, behaviour, or object that is perceived as new by its audience.

Diffusion of Innovations offers three valuable insights into the process of social change:

- What qualities make an innovation spread successfully.
- The importance of peer-peer conversations and peer networks.
- Understanding the needs of different user segments.

These insights have been tested in more than 6000 research studies and field tests, so they are amongst the most reliable in the social sciences.

What qualities make innovations spread?

Diffusion of Innovations takes a radically different approach to most other theories of change. Instead of focusing on persuading individuals to change, it sees change as being primarily about the evolution or “reinvention” of products and behaviours so they become better fits for the needs of individuals and groups. *In Diffusion of Innovations it is not people who change, but the innovations themselves.*

Why do certain innovations spread more quickly than others? And why do others fail? Diffusion scholars recognise five qualities that determine the success of an innovation.
1) **Relative advantage**
This is the degree to which an innovation is perceived as better than the idea it supersedes by a particular group of users, measured in terms that matter to those users, like economic advantage, social prestige, convenience, or satisfaction. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely to be.

There are no absolute rules for what constitutes “relative advantage”. It depends on the particular perceptions and needs of the user group.*

2) **Compatibility with existing values and practices**
This is the degree to which an innovation is perceived as being consistent with the values, past experiences, and needs of potential adopters. An idea that is incompatible with their values, norms or practices will not be adopted as rapidly as an innovation that is compatible.

3) **Simplicity and ease of use**
This is the degree to which an innovation is perceived as difficult to understand and use. New ideas that are simpler to understand are adopted more rapidly than innovations that require the adopter to develop new skills and understandings.

4) **Trialability**
This is the degree to which an innovation can be experimented with on a limited basis. An innovation that is trialable represents less uncertainty to the individual who is considering it.

5) **Observable results**
The easier it is for individuals to see the results of an innovation, the more likely they are to adopt it. Visible results lower uncertainty and also stimulate peer discussion of a new idea, as friends and neighbours of an adopter often request information about it.

According to Everett Rogers, these five qualities determine between 49 and 87 percent of the variation in the adoption of new products. ¹

These five qualities make a valuable checklist to frame focus group discussions or project evaluations. They can help identify weaknesses to be addressed when improving products or behaviours.

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Reinvention is a key principle in Diffusion of Innovations. The success of an innovation depends on how well it evolves to meet the needs of more and more demanding and risk-averse individuals in a population (the history of the mobile phone is a perfect example).

A good way to achieve this is to make users into partners in a continuous process of redevelopment. Computer games companies, pharmaceutical corporations and rural research institutes are examples of organisations that seek to make users active partners in improving innovations by supporting user communities or by applying participative action research techniques.

Many computer games are now built with the intention that they will be modified by enthusiastic users. Says consumer behaviour expert, Francine Gardin. “They’re actually participating in the design of the game. These consumers are really passionate about the game – it’s almost like a cult. They have an incredible sense of loyalty and ownership of that brand. Instead of complaining, they fix the product.”

The concept of reinvention is important because it tells us that no product or process can rest on its laurels: continuous improvement is the key to spreading an innovation.

The importance of peer-peer conversations and peer networks

The second important insight is that impersonal marketing methods like advertising and media stories may spread information about new innovations, but it’s conversations that spread adoption.

Why? Because the adoption of new products or behaviours involves the management of risk and uncertainty. It’s usually only people we personally know and trust – and who we know have successfully adopted the innovation themselves – who can give us credible reassurances that our attempts to change won’t result in embarrassment, humiliation, financial loss or wasted time.

Early adopters are the exception to this rule. They are on the lookout for advantages and tend to see the risks as low because they are financially more secure, more personally confident, and better informed about the particular product or behaviour. Often they will grasp at innovations on the basis of no more than a well worded news article. The rest of the population, however, see higher risks in change, and therefore require assurance from trusted peers that an innovation is do-able and provides genuine benefits.
As an innovation spreads from early adopters to majority audiences, face-to-face communication therefore becomes more essential to the decision to adopt. This principle is embodied in the Bass Forecasting Model (below), which illustrates how face-to-face communication becomes more influential over time, and mass media less influential.


The emphasis on peer-peer communication has led diffusion scholars to be interested in peer networks. Many diffusion-style campaigns now consciously attempt to utilise peer networks, for instance by using Popular Opinion Leader techniques or various “viral marketing” methods. These methods – which are becoming increasingly popular – aim to recruit well-connected individuals to spread new ideas through their own social networks.

Opinion leader tactics have been successful in raising the standards of practice by medical doctors, promoting weatherisation of homes, and encouraging safe sex in gay communities.

Rogers notes that by 2003 there had been eight randomised controlled trials – the gold standard in evaluation – all of which demonstrated the success of opinion leader tactics in producing behavioural changes.
Understanding the needs of different user segments

Diffusion researchers believe that a population can be broken down into five different segments, based on their propensity to adopt a specific innovation: innovators, early adopters, early majorities, late majorities and laggards.

Each group has its own “personality”, at least as far as its attitude to a particular innovation goes.

When thinking about these groups, don’t imagine it’s your job to shift people from one segment to another. It doesn’t work that way. It’s best to think of the membership of each segment as static. Innovations spread when they evolve to meet the needs of successive segments.

**Innovators:** The adoption process begins with a tiny number of visionary, imaginative innovators. They often lavish great time, energy and creativity on developing new ideas and gadgets. And they love to talk about them. Right now, they’re the ones busily building stills to convert cooking oil into diesel fuel and making websites to tell the world about it. Unfortunately their one-eyed fixation on a new behaviour or gadget can make them seem dangerously idealistic to the pragmatic majority. Yet no change program can thrive without their energy and commitment.

How to work with innovators:

- Track them down and become their “first followers”†, providing support and publicity for their ideas.

† See Derek Sivers’ entertaining [Youtube clip](http://www.youtube.com/watch?v=fW8amMCVAJQ) on the subject of first followers. It’s a very succinct and accurate insight into diffusion theory:
• Invite keen innovators to be partners in designing your project.

**Early adopters:** Once the benefits start to become apparent, early adopters leap in. They are on the lookout for a strategic leap forward in their lives or businesses and are quick to make connections between clever innovations and their personal needs.

They love getting an advantage over their peers and they have time and money to invest. They’re often fashion conscious and love to be seen as leaders: social prestige is one of their biggest drivers. Their natural desire to be trend setters causes the “take-off” of an innovation. Early adopters tend to be more economically successful, well connected and well informed and hence more socially respected. Their seemingly risky plunge into a new activity sets tongues wagging. Others watch to see whether they prosper or fail, and people start talking about the results. And early adopters like to talk about their successes. So the buzz intensifies. What early adopters say about an innovation determines its success. The more they crow and preen, the more likely the new behaviour or product will be perceived positively by the majority of a population.

Early adopters are vital for another reason. They become an independent test bed, ironing out the chinks and reinventing the innovation to suit mainstream needs.

Fortunately early adopters are an easy audience. They don’t need much persuading because they are on the lookout for anything that could give them a social or economic edge. When you call a public meeting to discuss energy-saving devices or new farming methods, they’re the ones who come along. They’re the first people in your block to install a water tank, mulch their garden, buy laptops for their kids, or install solar panels.

Some authorities talk about a “chasm” between visionary early adopters and pragmatic majorities.⁷ They think the chasm explains why many products are initially popular with early adopters but crash and burn before they reach mass markets. Everett Rogers disagreed⁸ with the idea of a chasm. He thought early adopters and majorities formed a continuum. However most early adopters still have radically different interests and needs from most majorities, so even if there’s no real chasm it’s a useful mental construct that warns us against the easy assumption that one size fits all. Once again, what makes products or practices spread is not persuasion. It’s the whether the product or behaviour is being reinvented to become easier, simpler, quicker, cheaper, and more advantageous.
How to work with early adopters:

- Offer strong face-to-face support for a limited number of early adopters to trial the new idea.
- Study the trials carefully to discover how to make the idea more convenient, low cost and marketable.
- Reward their egos e.g. with media coverage.
- Promote them as fashion leaders (beginning with the cultish end of the media market).
- Recruit and train some as peer educators.
- Maintain relationships with regular feedback.

Early majority: Assuming the product or behaviour leaps the chasm, it may eventually reach majority audiences. Early majorities are pragmatists, comfortable with moderately progressive ideas, but won’t act without solid proof of benefits. They are followers who are influenced by mainstream fashions and wary of fads. They want to hear “industry standard” and “endorsed by normal, respectable folks”.

Majorities are cost sensitive and risk averse. They are looking for simple, proven, better ways of doing what they already do. They require guaranteed off-the-shelf performance, minimum disruption, minimum commitment of time, minimum learning, and either cost neutrality or rapid payback periods. And they hate complexity. They haven’t got time to think about your product or project. They’re too busy getting the kids to football and running their businesses. If they do have spare time they’re not going to spend it fussing around with complicated, expensive, inconvenient products or behaviours. They want to hear “plug-and-play”, “no sweat” or “user-friendly” and “value for money”.

How to work with the early majority:

- Offer give-aways or competitions to stimulate buzz.
- Use mainstream advertising and media stories featuring endorsements from credible, respected, similar folks.
- Lower the entry cost and guarantee performance.
- Redesign to maximise ease and simplicity.
• Cut the red tape: simplify application forms and instructions.

• Provide strong customer service and support.

**Late majority:** They are conservative pragmatists who hate risk and are uncomfortable your new idea. Practically their only driver is the fear of not fitting in, hence they will follow mainstream fashions and established standards. They are often influenced by the fears and opinions of laggards.

How to work with the late majority:

• Focus on promoting social norms rather than just product benefits: they’ll want to hear that plenty of other conservative folks like themselves think it’s normal or indispensable.

• Keep refining the product to increase convenience and reduce costs.

• Emphasise the risks of being left behind.

• Respond to criticisms from laggards.

**Laggards:** Meanwhile laggards hold out to the bitter end. They are people who see a high risk in adopting a particular product or behaviour. Some of them are so worried they stay awake all night, tossing and turning, thinking up arguments against it. And don’t forget they might be right! It’s possible they are not really not laggards at all, but innovators of ideas that are so new they challenge your paradigms! In the early stages, where you are focusing on early adopters, you can probably ignore the views of laggards, but when you come to work with late majorities you’ll need to address their criticisms, because late majorities share many of their fears.

How to work with laggards:

• Give them high levels of personal control over when, where, how and whether they do the new behaviour.

• Maximise their familiarity with new products or behaviours. Let them see exactly how other laggards have successfully adopted the innovation.

Each of these adopter personalities is very different. It’s vital to know which one you are addressing at a given time. And no, you usually can’t address them all at once. Why? Because products and behaviours only mature gradually. The exception is when you have
customized quite *different* products or behaviours for each group. Weight Watchers is an example. It has a traditional calorie-counting method that suits early adopters, a “points value” method that suits early majorities, and a “no count” system for everyone else.

How big is each segment? Rogers went as far as assigning precise notional percentages for each segment:

- Innovators: 2.5%
- Early Adopters: 13.5%
- Early majority: 34%
- Late majority: 34%
- Laggards: 16%  

However the “20:60:20 Rule” is a good all-purpose rule of thumb.

When designing a change project you need to know one vital fact: the percentage who have already taken up the innovation. That figure tells you which segment you are addressing next. It gives you great insight into how to design your project and how to pitch your communications.

Of course, no one is an innovator or a laggard about all new ideas. That would be too exhausting. In reality, most people are majorities about most things, and only innovators or laggards about certain specific things. We wouldn’t say “John is a laggard”, we’d say “John is an *iPhone* laggard” or “George Bush snr is a *broccoli* laggard”.

**Reading**


**Endnotes**


6 Rogers op. cit. p322
8 Rogers, op. cit. p282
9 Ibid. p281