



United to Improve
America's Health®



MARKET POSITION

2000 Research Series

Spreading Good Ideas for Better Health Care

A Practical Toolkit

Volume 2
by Paul Plsek

TOOLS, PERSPECTIVES
AND INFORMATION FOR
HEALTH CARE LEADERS

Acknowledgements

Spreading Good Ideas For Better Health Care: A Practical Toolkit was written for VHA by Paul Plsek. Paul is an internationally recognized consultant who specializes in health care improvement. In addition to leading his own firm, Paul is also a Senior Fellow at the Institute for Healthcare Improvement, the author of three books and numerous journal articles, and a collaborator in several health services research projects.

The idea for the toolkit came from Jim Roberts, M.D. who provided invaluable leadership before his retirement from VHA Inc. The VHA Inc. steering committee who oversaw the work consisted of John Collins, M.D.; Nancy Wilson, M.D.; Ken Smithson, M.D., and Colleen Risk. Many of the tools and concepts in this kit were first tested in the Coaching and Leadership initiative in VHA Upper Midwest, led by Paul Green, RN and Mary Jo Morrison.

We are grateful to the members of VHA's Physician Leaders Network who reviewed the work and added helpful input along the way. Various VHA member organizations graciously added their case studies as examples. It is their good work that brings these tools to life.

2000 Research Series

Volume 2

Spreading Good Ideas for Better Health Care

A Practical Toolkit

by Paul Plsek

Table of Contents

- Frustration for Leaders: Good Ideas Are Not Spreading!.....3
- Some Theory on the Spread of Improvement5
 - Diffusion of Innovation Research
 - Psychology of Change
 - Complexity Theory
- Summary of Key Concepts for Leaders 11
- Tools for Spread..... 13
 - Spread Potential Worksheet
 - Change Concepts and Concept Fans
 - Spread Matrix
 - Social Networks and Opinion Leaders
 - Attractors
 - Certainty and Agreement Diagram
- Leadership for Spread..... 41
- Communications and Observability of Change..... 46
- Action Steps, Getting Started 48
- Bibliography 50

Frustration for Leaders: Good Ideas Are Not Spreading!

Over the last decade there has been tremendous growth in the use of improvement methodologies in health care. Dozens of books and hundreds of journal articles have appeared describing success stories. Tens of thousands of teams have demonstrated better ways of doing everything from administering medications to reducing delays.

Unfortunately, leaders are increasingly realizing that their organizations are becoming “islands of improvement.” A nursing unit in one service line develops a better way to monitor patients’ pain, but that way does not become the organizational standard. A team working on diabetes in a clinic develops an innovative approach to patient-centered care, but the benefits of that innovation are not adapted for other chronically ill groups. A hospital sponsors a very successful team in a national improvement collaborative, but other teams in the organization gain little from the effort. Multiple institutions come together in a merger, but the knowledge that each has acquired about better ways of doing things does not naturally spread to the others in the new, integrated health care system.

At a time of ever-decreasing resources and time availability, and with increasing public pressure for improvement, health care organizations need ideas for better ways of doing things now, more than ever before. But are we putting most of our improvement efforts into simply rediscovering the same ideas that others have already found? Can we afford to be so wasteful in our improvement efforts?

- Consider the project reports and storyboards that your organization proudly presented at its last accreditation visit or educational conference. What did these successful teams learn that could benefit other improvement efforts in your organization? Did your organization succeed in spreading this learning? Have the ideas presented in the reports and storyboards now become standard practice throughout your organization? Take one or two projects and identify specific areas to which the learning should have spread, but did not.
- Review a list of your current improvement projects and teams. What percentage are addressing issues that are absolutely unique; no one has ever dealt with a similar issue in health care before? In how many cases do you suspect that someone has previously dealt with the issue within your own organization? In a closely allied organization, another VHA member, or somewhere in health care?

Based on your answers to the questions above, what is your estimate of the percentage of organizational improvement effort that seems to be going into relearning something that someone else has already learned? Given the pressures your organization faces, does the percentage seem reasonable to you, or does it seem somewhat wasteful?

Consider the difference between placing a drop of colored dye in a bucket of water, and another in a bucket of gelatin. The bucket of water becomes uniformly colored in a matter of minutes. But one could watch the bucket of gelatin for some time and still only see a spot of localized color. If the drop represents a new idea for a better way of doing things, what best describes your organization's response to that idea? Gelatin or water?

Some Theory on the Spread of Improvement

Fortunately, we know a great deal about how ideas spread. Every change has both a technical aspect (the nature of the change itself) and a social aspect (how people feel about doing it). In order for an idea to spread, people need first to find out about it, and then to get beyond emotional, structural, or resource thresholds that might be barriers to its implementation. These two aspects (technical and social) and two activities (disseminating information and overcoming thresholds for change) are interrelated in complex ways.

Diffusion of Innovation Research

Everett Rogers has studied the spread of thousands of innovations – in settings ranging from agriculture to medicine – and has identified five characteristics of changes that spread easily:¹

- clear advantage compared to the current way of doing things
- compatible with the current system and values
- simplicity of the change and its implementation
- ease of testing before making a full commitment
- observability of the change and its impact

Note how the technical aspects of the change such as advantage, compatibility with the current system and simplicity are intertwined with the social aspects of compatibility with values, commitment, and observation of others. Both are critical. Technically rational ideas for improvement can fail if the social aspects of change are not well handled.

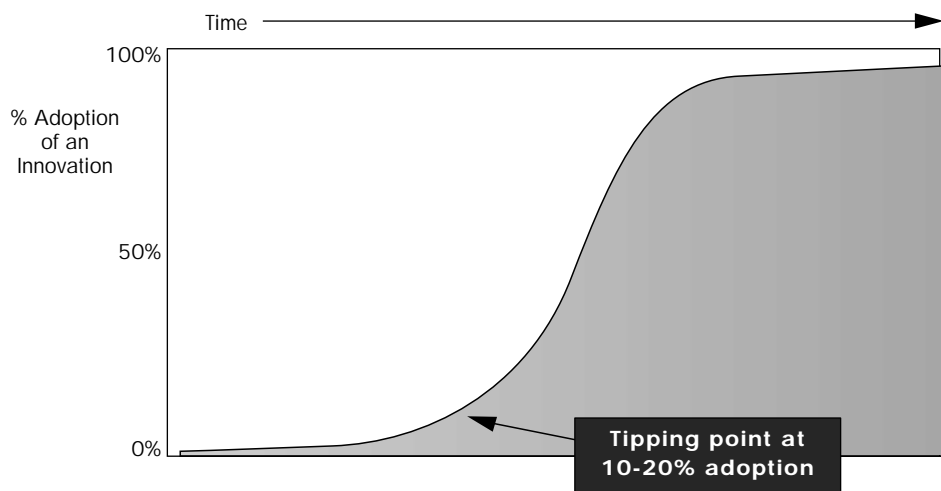
The research further indicates that the spread of ideas is a non-linear, dynamic process.² A plot of the cumulative number of adopters of a specific innovation over time typically displays a non-linear “s-curve,” as shown in Figure 1.

¹ Rogers E.M., *Diffusion of Innovations*. Fourth Edition. New York: Free Press, 1995

² Rogers; Van de Ven A.H., Polley D. E., Garud R, and Venkataraman S., *The Innovation Journey*. Oxford, England: Oxford University Press, 1999.

Figure 1

The spread of new ideas typically follows a non-linear, s-curve.

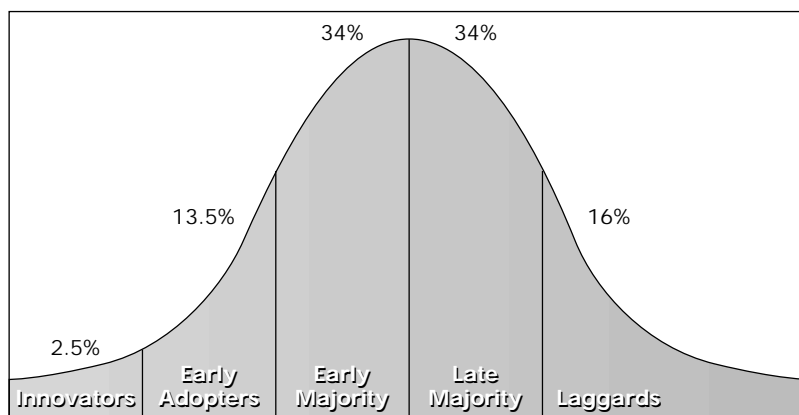


The spread process starts slowly and small, with only a few early adopters. Over time, the spread process seems to reach a “tipping point,”³ where it accelerates dramatically and a majority adopt the idea. Spread then slows once again as the remaining hold-outs finally take up the idea, typically leveling off at some point shy of 100 percent.

Another view of this non-linear phenomenon is shown in Figure 2.⁴

Figure 2

Individuals can be categorized as to when they adopt a new idea.



Source: Rogers

³ Gladwell M., *The Tipping Point: How Little Things Can Make a Big Difference*. New York: Little, Brown, and Company, 2000.

⁴ Rogers

Following initiation by the innovator, ideas spread initially to another, still small, group of early adopters. These early adopters hear about the innovation through some social or information network connection to the innovators (these connections are the social capital of the system).⁵

If many people hear about the innovation, why do only a relatively small fraction (less than 15 percent by Rogers' estimate) actually take it up initially? Social network theorists⁶ suggest that the early adopters have a lower threshold for the change than the general population. We might describe them as more action-oriented, resourceful people who are willing to take risks. They are also often the opinion leaders in their social network.⁷ If these opinion-leading early-adopters are successful, this lowers the thresholds that may be holding back the majority of others. The majority can be thought of as naturally taking a wait and see attitude toward the innovation.

The success of the early adopters and the consequent lowering of the change threshold for the majority creates the tipping point phenomenon and the acceleration of spread that we noted on the s-curve. At this point, the five characteristics for natural spread are now in place for the majority of people—they can judge for themselves the advantages, compatibility, and simplicity of the change, and they have had the opportunity to observe others and to try it out themselves. Rogers notes that once this 10 percent to 20 percent adoption point is reached, "...it is often impossible to stop further diffusion of the new idea, even if one wished to do so".⁸

It is important to point out that the adopter categories of Figure 2 do not necessarily correspond to durable personality traits in individuals. An individual can be an early adopter on one idea and in the late majority on another. The categories should not be used for stereotyping.

A final key point from the research on the spread of ideas is the concept of reinvention.⁹ To understand this concept, ask yourself this, "What change is someone else most likely to adopt; my change, or a change that they thought of themselves"? Obviously, since change is an emotional and social process, the threshold is lowered when the adopters of the change feel that they have some latitude to reinvent the specific details in a way that they can feel makes it uniquely theirs. Advocates do best by promoting the basic concepts behind the change, while allowing the details to be re-invented as the idea spreads.

⁵ Coleman J., *Social Capital in the Creation of Human Capital*. *American Journal of Sociology*, 1988, 94: 95-120.

⁶ Granovetter M., *Threshold Models of Collective Behavior*. *American Journal of Sociology*. 1978, 83: 1420-1443.

⁷ Rogers; Van de Ven et. al.

⁸ Rogers

⁹ Rogers

Psychology of Change

Psychology clearly plays a role in the spread of ideas. Thresholds for change are individualized and emotive.¹⁰ Reasonable people can differ on their assessment of the need for change, the relative advantage of a specific idea, or its compatibility with current organizational values.

One easy-to-grasp model from the addiction psychology literature is the classic Four Stages of Personal Change.¹¹ According to this widely accepted model, individuals can be in various stages of:

1. Precontemplation; not ready to even discuss or consider a change
2. Contemplation; willing to listen and consider a change
3. Action; ready to do something concrete
4. Maintenance; having made a change and striving not to slip back into old behaviors

It is not hard to see these classic stages in our colleagues when we talk about spreading ideas for improvement. We might say that many are “addicted” to the status quo.

The advice about appropriate actions for the advocate of change to take is intuitively sensible. For example, consider someone who is in Precontemplation. The advocate of change must first set up feedback conditions that capture the emotional attention of the person and move him or her into the Contemplation stage. So, in this situation, providing data feedback on performance relative to peers, or dramatically telling the story of a particularly bad patient experience, might be more useful than trying to present the detailed case study of a successful change in some other organizational unit. Similar thought and intuition should bring to mind many obvious do’s and don’ts for change advocates, depending on the stage that the change receivers are in. The often overlooked key is the realization that the leader needs different messages for different audiences. Knowing the audience and thoughtfully tailoring the message are required actions for the successful spread of ideas.

¹⁰ Argyris C., *Overcoming Organizational Defenses*. Boston, MA: Allyn & Bacon, 1990; Beckhard R. and Harris R.T., *Organizational Transitions: Managing Complex Change*, Second Edition. Reading, MA: Addison-Wesley, 1987; Bridges W., *Managing Transitions: Making the Most of Change*. San Francisco: Perseus Press, 1991.

¹¹ DiClemente C.C. and Prochaska J.O., *Self-Change and Therapy Change in Smoking Behavior: A comparison of processes of change in cessation and maintenance*. *Addictive Behaviors*, 7, 133-142.

Complexity Theory

Organizations are complex adaptive systems. *Systems* in the sense that there is coordinated action toward some purpose. *Complex* in the sense that there are many and varied relationships among the parts of the system, making detailed behavior hard to predict. And *adaptive* in the sense that the people who make up the system can change and evolve in response to new conditions in the environment. Through the science of complexity, we are beginning to understand more about the behavior of such systems in human society and the natural world.¹²

Non-linearity, such as we earlier noted when discussing the nature of spread, is a fundamental dynamic in all CAS.¹³ In CAS all people, relationships, and issues are not equal. Some individuals are more likely than others to be the initial sources of innovative ideas. Some are more influential than others. Some have a lower threshold for making the change.

In an organizational CAS, all individuals have the freedom to make up their own minds about a change; no one can be coerced. In this sense, all change in an organization is voluntary.

The complexity theory concept of attractors¹⁴ helps us understand why an individual might be an early adopter of one idea, but a late adopter of another. In the former case, something about the change matched a natural attractor in the complex system of the individual. Examples of attractors might include professional autonomy, comfort, or an inward view of oneself as a scientist. When the change idea naturally overlaps an attractor in the system, the threshold is lowered and spread to that individual occurs quickly.

Complexity theory also teaches us that full agreement and total consensus are not needed for progress in a CAS. Indeed, complexity science suggests that innovation and creativity occur at the “edge of chaos”, a region of only moderate certainty and agreement within the CAS as to how best to proceed (see Figure 3.)¹⁵

¹² Anderson P., *Seven Levers for Guiding the Evolving Enterprise*. In Clippinger J.H., *The Biology of Business: Decoding the Natural Laws of Enterprise*. San Francisco: Jossey-Bass, 1999; Capra F., *The Web of Life: The New Scientific Understanding of Living Systems*. New York: Anchor Books, 1996.

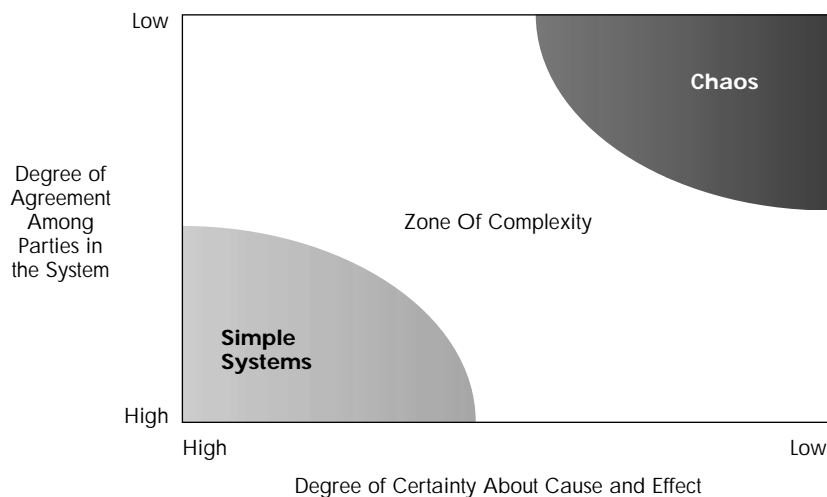
¹³ Zimmerman B.J., Lindberg C. and Plsek P.E., *Edgework: Complexity Resources for Healthcare Leaders*. Dallas, TX: VHA Publishing, 1998; Brown S.L. and Eisenhardt K.M., *Competing on the Edge: Strategy as Structured Chaos*. Cambridge, MA: Harvard Business School Press, 1998.

¹⁴ Plsek and Kilo

¹⁵ Stacey; Zimmerman et. al.

Figure 3

Complex systems operate at the edge of chaos on the Certainty-Agreement diagram.
(Based on Stacey 1996)



Leading at this “edge of chaos” will initially feel uncomfortable for leaders who might wish that they could implement good changes with the precision that a mechanic can upgrade a race car’s fuel system with the latest technology.¹⁶ But it is simply not that way in a CAS. Rather, the spread of change is naturally a somewhat messy process. Just as the process of evolution in species leads to many useful and not-so-useful variations, we must expect some degree of exploration and experimentation in the spread of improvement ideas within organizations.

As we noted in discussing reinvention, change occurs more naturally when there is flexibility on the details of the change. At the same time, we cannot expect constructive change and the spread of good ideas to occur in an infinitely flexible setting. CAS theory suggests that we should be inflexible on the basic concepts of the change, yet flexible on the details needed to implement that change in a specific setting. Such paradox (we need to be both flexible and inflexible at the same time!) is characteristic of CAS.¹⁷ Research indicates that such systems operate with simple rules, or “min specs”. For example, the flocking behavior of birds seems to follow three simple rules: avoid collisions, match speed with others, and try to go generally where others are going. There is wide latitude for detailed flying behavior within these “min specs”, but if a bird violates any of these rules the result does not satisfy the aim of flocking.

¹⁶ Brown S.L. and Eisenhardt K.M., *Competing on the Edge: Strategy as Structured Chaos*. Cambridge, MA: Harvard Business School Press, 1998; Lewin R. and Regine B., *The Soul at Work: Embracing Complexity Science for Business Success*. New York: Simon & Schuster, 2000.

¹⁷ Zimmerman et. al.; Brown and Eisenhardt; Lewin and Regine

Finally, note that complex systems are naturally embedded within other complex systems; individuals experience multiple linkages to a variety of systems. For example, a staff nurse is simultaneously part of the hospital's CAS, a member of the nursing profession CAS, a part of a complex social network, and so on. This naturally creates the possibility of conflicting forces and relationships in regard to a specific change. Therefore, the perceived source of information about the change is important. It may not be enough to say that the hospital advocates a certain change, if, for example, the nursing profession or close friends oppose it. An advocate of change cannot hope to control all these system boundaries and relationships, and must instead recognize and work with them.

Summary of Key Concepts for Leaders

The research from the fields of diffusion of innovation, psychology, and CAS has important practical implications for leaders who desire greater spread of ideas within their organizations. Let's summarize the key points:

1. Technically rational ideas will fail to spread if we ignore the social aspects of change. Spread requires our attention both to disseminating information about the idea and overcoming thresholds that might act as barriers.
2. Ideas that spread quickly share five characteristics. They are: (1) advantageous, (2) compatible, (3) simple, (4) trialable, and (5) observable. Work to increase these characteristics in the ideas you wish to spread.
3. New ideas almost always begin in some small corner among a few mavericks or resourceful people. Find ways to encourage such development and bring to light successes, rather than relying only on formal committees or organizational structures for innovative ideas.
4. While there is no harm in broad discussion about successful innovations, it is naive to assume that any more than a few people or groups have sufficiently low thresholds to be willing to try an idea initially. Rather than seeking organization-wide consensus, a wiser early goal is to seek to reach the 10 percent to 20 percent adoption point with those who are willing. This makes the problem of spread much more manageable. Create conditions where willing volunteers can try out the idea, and set up the means for others to observe what is going on without feeling pushed to commit before they are ready.
5. Ideas need to be reinvented as they spread. You will need to embrace the paradox of being inflexible on a few "min specs" surrounding the basic change concept, but

highly flexible on the details of how the change is implemented in a specific setting. Expect spread to be a somewhat messy process of experimentation and adaptation.

6. Know the stage of your audience in the psychological process of change. Tailor your message. If you want an idea to spread, you must deliberately move others through a process of first becoming personally aware of the need for change, then aware of the change concepts, and finally moved to detailed action. You cannot skip steps in this process.
7. There are natural attractors in complex human systems that drive behavior and maintain the status quo. Seek to understand and work with these. For example, if comfort or professional autonomy are strong attractors in your organizational system, you must either confront these explicitly (hard work, not likely to be successful) or explain your idea in ways that match up with the attractors (preferred approach).
8. Individuals have freedom and are simultaneously part of several different social systems. Therefore, the perceived source and endorsement of a change matters. Seek to understand and work with these forces; it does little good to try to work against them. Line up clear endorsements from individuals and groups that your audience respects.

We can do it. We can be more deliberate and resourceful when it comes to getting good ideas for change to spread across our organizations. There is solid research and theory to support our actions. Let's stop wastefully beginning every improvement effort with a blank sheet as if we were the first ones in health care to tackle the issue. Let's turn our organizations into pools of water in which ideas spread as naturally as drops of colored dye.

Tools for Spread

The theory leads directly to a set of tools that we can use to accelerate the spread of good ideas for improvement throughout our organizations.

Each tool is fully described with helpful hints and illustrative examples of use in health care. Become familiar with each of them. Refer back to the text often as you use them to guide your reflection and on-going learning.

Spread Potential Worksheet

Figure 4

A worksheet to guide early thinking about how we might increase the probability that an idea will spread. (Based on an idea from Jim Roberts, M.D. VHA and the work of Everett Rogers.)

	Score	Plan to increase
Strength of evidence	○ ○ ○ ○ ○ 1 2 3 4 5	
Relative advantage	○ ○ ○ ○ ○ 1 2 3 4 5	
Simplicity	○ ○ ○ ○ ○ 1 2 3 4 5	
Compatibility	○ ○ ○ ○ ○ 1 2 3 4 5	
Trialability	○ ○ ○ ○ ○ 1 2 3 4 5	
Observability	○ ○ ○ ○ ○ 1 2 3 4 5	

Score: 1 low; 5 high
Plan to increase: What can we do to increase the score?

Introduction and Link to Theory

Everett Rogers’ research on the diffusion of innovation indicates that ideas that spread naturally share five characteristics. They are: (1) advantageous, (2) compatible, (3) simple, (4) trialable, and (5) observable. These are natural attractors in a complex human social system. It is therefore useful to deliberately increase these characteristics in the ideas you wish to spread. We further know from our experience in health care that the strength of the evidence supporting a clinical change is another powerful attractor.

Description of the Tool

Focusing on a particular change that you wish to spread, score each of the six items on the worksheet in Figure 4 using a subjective 1-5 (low to high) scale. For example, ask: “Given the way we are envisioning the change now, how clear will it be to others that there is a relative advantage over the current way?” and “Given the way we are envisioning the change now, how easy will it be for others to try it out before fully committing?” The point is to assess current thinking so that you can plan to enhance each item on the worksheet before you embark on spread.

If you are working in a group, come to consensus on the score through discussion. This discussion is important as individuals may have different points of view, or information sources of which others in the group are unaware. Avoid the temptation simply to tally votes or take an average of independently assessed scores. Instead, talk it out.

In the third column, record your plans to increase the scores on each item in preparation for wider spread. See the “Helpful Hints for Application” section below for suggestions for things to try.

Who Might Use This Tool and When In the Process of Spread

This tool is designed for use by the pilot team and the leaders who are overseeing the spread of the change. The best time to use it is early in the pilot. Ideally, this would be at the point where the major changes to be spread are clear, but there is still time to do such things as gather data to support claims of relative advantage, or set up mechanisms by which others can openly observe the progress of the pilot. Waiting until the pilot is finished before you think about spread might mean that you will enter the spread process with insufficient technical and social support for the change.

Examples of Use

A care team in a clinic achieved initial success using group visits for diabetics. The Chief Medical Officer is encouraged by this initial work and would like to see the concept of group visits spread to other care teams treating diabetics, as well as to those caring for other groups of patients with chronic illness. The CMO meets with the team to develop a spread potential worksheet.

The team rates the strength of the evidence for group visits for diabetics as a “4.” They know the key articles and have already prepared a presentation. But they must give a score of “?” for the strength of evidence for the use of group visits for other classes of chronically ill patients because they simply do not know. The CMO and care team leader agree to have a member of the CMO’s staff conduct a MedLine search and literature review.

The care team initially rates the relative advantage item as a “5.” They see the advantage and are enthusiastic about it. The CMO cautions that they need to keep in mind the point of view of the receivers of the idea in the spread process; to what extent will they naturally see a relative advantage as soon as they hear the idea? This leads to a discussion about the questions that are likely to come up, such as “Won’t the patients feel abandoned or be reluctant to share clinical details in a group?” “Doesn’t it take more time to work with a group, rather than one-on-one?” and so on. Based on this discussion and clarification, they change the score to “3.” The care team develops a plan for collecting the information now that will be useful to have in the future when these questions come up during spread. For example, they will conduct a patient satisfaction survey. But knowing from past experience that dry numbers are not fully attractive, they also plan to produce a short videotape in which patients can describe their own feelings about the group visits.

The productive discussion continues through the other items on the worksheet, and the care team and CMO emerge with a list of action items to pursue as the pilot continues.

Helpful Hints for Application

Below are some ideas for increasing the scores on the individual items. Be creative. Come up with your own approaches. Remember that change has both a technical and emotional side. Of course, you are enthusiastic about the idea, but think about the change from the point of view of the receivers. Consider how you can make the change even more attractive to them.

Strength of evidence: do a literature search; contact noted experts directly; bring in experts for presentations; compile a critically appraised topic worksheet (see Sackett reference in bibliography); make a site visit; collect your own data; analyze your performance using statistical methods and statistical process control tools (see Langley, et. al. reference in bibliography).

Relative advantage: compile data from the pilot site to construct a before-and-after picture of performance relative to a dashboard of indicators on outcomes, satisfaction, costs, process efficiency, etc.; talk to opinion leaders at potential target sites and learn what data they will need to be convinced of the advantage; collect a few powerful anecdotes in addition to hard data; record patient and staff testimonials; let opinion leaders from the pilot site tell their own stories.

Simplicity: relook at your experience of change and strip away everything that is not core to the change strategy; do some incremental improvement at the pilot site to make your change even better and more straightforward; put together a “resource kit” of helpful items that others can use as they test the changes.

Compatibility: tie the change to organizational culture and values; tie to professional image and ethics; offer advice and support to interface the change with existing systems and ways of working; construct a concept fan to show that there are many ways to do it; use the concept of attractors (see the Concept Fan and Attractors sections of this guidebook for more).

Trialability: use rapid-cycle PDSA methods to break the change down into small steps that can be tested; develop and offer simple measurement tools that allow others to gauge their progress and success as they go along.

Observability: talk about the pilot site experience constantly and through a variety of channels (see the section on communication for more ideas); start a newsletter or e-mail report and distribute it widely; invite opinion leaders from potential target sites to visit the pilot; do everything you can to let people know what you are doing, without forcing them to make a final choice.

Source and References

The worksheet was developed by Jim Roberts, M.D. (VHA Inc.) based on concepts from Everett Rogers' book *Diffusion of Innovation*.

Change Concepts and Concept Fans

Introduction and Tie to Theory

What idea for change are others most likely to adopt: your idea, or an idea that they believe they came up with themselves? The psychology of change is such that there is a higher probability of action when individuals feel that an idea is theirs. The research on the diffusion of innovation points out that ideas nearly always undergo reinvention as they spread. The main concept remains intact, but the specifics evolve as individuals adapt the idea to their local environment within the complex system.

Description of the Tool

A change concept is a general idea for improvement that has a strong foundation in logic or experience, and that can stimulate specific ideas for change in a given context. An example of a change concept that can lead to reductions in waits and delays is “do tasks in parallel.” A team in a pilot site may have chosen to modify the flow of their process to do certain tasks in parallel because it made sense to do so, given their specific personnel and physical layout. But if the change advocate presents her experience in a way that seems to say that the spread sites should do exactly those same tasks in parallel, in exactly the way that worked so well at the pilot site, resistance and cries of “but we are different” are the likely response. Presenting the general change concept, describing what the pilot site did as simply one way to do it, and engaging others in an exploration of natural opportunities to do tasks in parallel at their own site might yield a better result. After some exploration, the spread site might decide simply to replicate what was done at the pilot site; but it then becomes a choice that they have made.

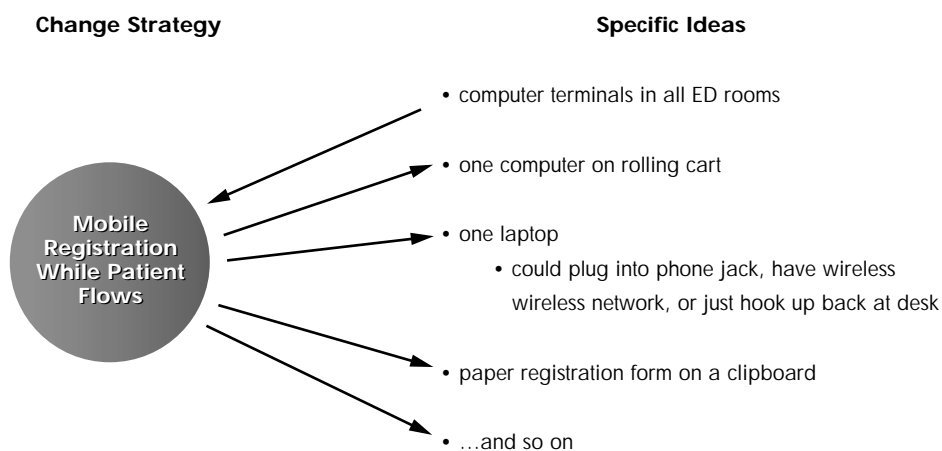
The bottom line point for advocates of spread is this: Seek to spread a general change concept; allow others to adapt and reinvent the specifics to fit their situation.

To identify a change concept, start by reviewing the specific changes that you have tested in your pilot. Ask yourself questions such as: What’s the main idea here? What is the key point that made this successful? What did we really do in essence when you get right down to it? A well-stated change concept should be no more than a phrase or sentence that conveys the essence of the idea.

The concept fan is a group discussion graphical aid that one can use to encourage brainstorming input from others (see Figure 5.) The left side of the sheet displays the change concept in a bubble. Specific ideas that describe various ways of concretely realizing that change concept are listed on the right side of the sheet. Ideas “fan out” from the general change concept. (See the example below for more illustration.)

Figure 5

A concept fan is a brainstorming tool for capturing alternative ways to implement a change concept.



Who Might Use This Tool and When In the Process of Spread

Advocates for spread can develop change concepts based on a review of a successful pilot. (It is important to note that the pilot site might be quite distant, even in another organization or industry. This point is illustrated in the first example below.) These change concepts should then figure prominently in presentations given to spread sites. The concept fan can be used in discussions with spread sites after these presentations to brainstorm specific ideas for how they might adapt the concept to their setting.

Examples of Use

The examples below illustrate the key role that change concepts can play at various points in the process of spread.

Mobile registration. The director of a hospital emergency department is concerned

about low patient satisfaction scores and long waits before the patient sees a clinician. She attends a national conference and hears about a hospital that has computers in all its ED exam rooms. Patients entering the ED are quickly brought into nurse triage and then roomed. The registration clerk visits the patient and family in the room to gather the detailed registration information using the networked computers.

The director is excited about the idea and wishes to spread it into her organization. She knows, however, that she will likely be rejected because the hospital's budget cannot cover the cost of computers in all ED rooms. On the flight home from the conference she explores the idea and realizes that the essence of what makes it work is the concept: mobile registration while the patient continues to flow in the care process.

She immediately thinks of several more cost-effective ways to do mobile registration. Understanding the psychology of spread, however, she resists the urge to come up with an “all thought out” presentation and instead opts to engage her managers in a conversation at the weekly staff meeting. She shares the presentation with the group and writes “computer terminals in all ED rooms” at the top-right of an easel sheet. She explains that she knows that this is too costly a solution. She draws an arrow to the left and explains that it occurred to her that the main idea was “mobile registration while the patient flows;” which she writes in a bubble on the left of the sheet. She then encourages group brainstorming and captures several ideas (see Figure 5.)

The group decides that the cheapest and simplest way to test the change initially is to use a paper form and clipboard for a week, while monitoring satisfaction, flow-times, and clerk task-times. (Note that this approach links to several of Rogers' five characteristics for spread.) If this is successful, the data may help make the case for the purchase of a rolling cart for the existing registration terminal, or may even justify the purchase of a single laptop. The managers seem quite proud of their cleverness and resourcefulness, a quite different reaction than what she usually gets when she returns from a conference with a great idea to share with the team!

The ED director shares the story with the vice president of patient services and they realize that the concept of mobile registration might be useful in any setting where patients currently must undergo detailed questioning at a registration desk before moving on in the clinical process. Mobile registration is a change concept that should be widely spread throughout the organization.

Form follows flow. Consider also the case of a team involved in a regional VHA Clinical Advantage collaborative on reducing medication errors. In the Advanced Learning Workshop sessions, the team learns several change strategies—for example “avoid abbreviations” and “use protocols wisely”—from the expert faculty. They take these concepts and develop specific applications that they can test in their organization using the rapid-cycle PDSA approach.

During one of the cycles, a nurse on the team realizes that a potential source of error is a certain form that many nurses complain about. The process of filling out this form requires the nurse to complete an item in the top section, skip down to items in the middle of the form, then back up to the top with the results of a calculation, and so on. Errors and empty fields often result. The team redesigns the form to make it flow with the natural thinking process that one goes through in filling it out.

This has been a useful innovation for this specific medication ordering process, and the team could just leave it at that. However, if we explore the essence of the innovation we see a new change concept: make forms follow the natural flow of the thinking process. This is a change concept that could be usefully spread to many commonly used forms in a hospital. (A concept fan for this might simply list the specific forms that could benefit from such a redesign.)

Helpful Hints for Application

There may be several different ways to express the essence of a change concept. There is no “right” or perfect way. Recalling Rogers’ research and the Spread Potential Worksheet, keep in mind that you are seeking a simple-sounding statement that conveys a natural advantage over the current situation, and connects with other’s values and view of the need. “Mobile registration” has a clear, simple, “ah-ha” quality to it. And surely most people would agree that we need to enhance patient flow in the ED, or that forms would be easier to fill out if they followed the natural thinking process.

Share your change concept thinking with several trusted colleagues before “going public.” Some people are naturally better at seeing the essence or stating things succinctly; the process of explaining it and getting input will help you refine your statement.

Critically test your change concept statement to assure that you really are expressing the essence. For every word or phrase, ask: Must it be that way, or am I being too constraining?

In the ED example above, the director could have said that the change concept was: register the patient in the ED exam room. But must it be that way? Can we not register them in the triage room, in the hall way, or while they wait in the adjacent radiology suite? Keep challenging your thinking until you get the most general statement.

There is no necessity to have only a single statement of the change concept. There may truly be multiple change concepts behind a successful change. Construct concept fans and brainstorm around each concept. The final idea that is tested may be a combination of several ideas.

If your group is not familiar with them, it might be useful to quickly state the ground rules of brainstorming before constructing a concept fan. The four main ground rules are: no criticism allowed, free-wheeling discussion is welcomed, go for quantity, and build on the ideas of others.

Avoid loading down your change concept with constraints. It may be that there is a limited budget, issues of information systems compatibility, or approvals required from formal committees. Be clear about such things and do not hide the constraints. However, placing such constraints in the change concept limits thinking and drains energy. Keep the brainstorming wide open (“every idea is a good one”) and then use the constraints to evaluate or modify the ideas. For example, the laptop computer that we eventually purchase to do mobile registration in the ED may need to be of a certain type and contain specific software in order to be compatible with our information systems, but that is a detail that we can work out later. Likewise, use any budget constraints later to select which of the brainstormed ideas to test. Prescribing in the change concept that the solution must be under \$1,000 might lead a participant to not even mention a laptop because he knows it costs several thousand dollars new. However, once the idea is listed, the group might realize that for this rather simple application an old, currently unused laptop might be adequate with a few hundred dollars of software and memory upgrades.

Source and References

The concept of reinvention is described throughout the diffusion of innovation literature. Langley and colleagues brought the notion of change concepts into the language of quality improvement in their book *The Improvement Guide*. Creativity expert Edward de Bono developed the concept fan tool; see for example his book *Serious Creativity* or Plsek's book *Creativity, Innovation, and Quality*.

Spread Matrix

Introduction and Tie to Theory

The research on the diffusion of innovations applies to the challenge of spreading an idea within a target population. Clearly, identifying that target population is a key early step in spread. With targets in mind, we can make specific plans around other aspects of spread, such as the psychology of the change, attractors, or opinion leaders.

Description of the Tool

The spread matrix (see Figure 6) is a planning tool that directs our thinking at the who, what, and when aspects of spread. Down the side of the matrix are listed the targets for spread. Time is displayed across the top. The cells of the matrix are used to indicate which change concepts will be spread to which target sites in a given time. For compactness, the change concepts are often given an alphanumeric designation corresponding to a key somewhere on the matrix. Optionally, the cells might also contain additional information on such things as the extent of expected coverage planned in that time frame.

Figure 6

The spread matrix helps us think through a deliberate strategy for spreading specific improvement ideas.

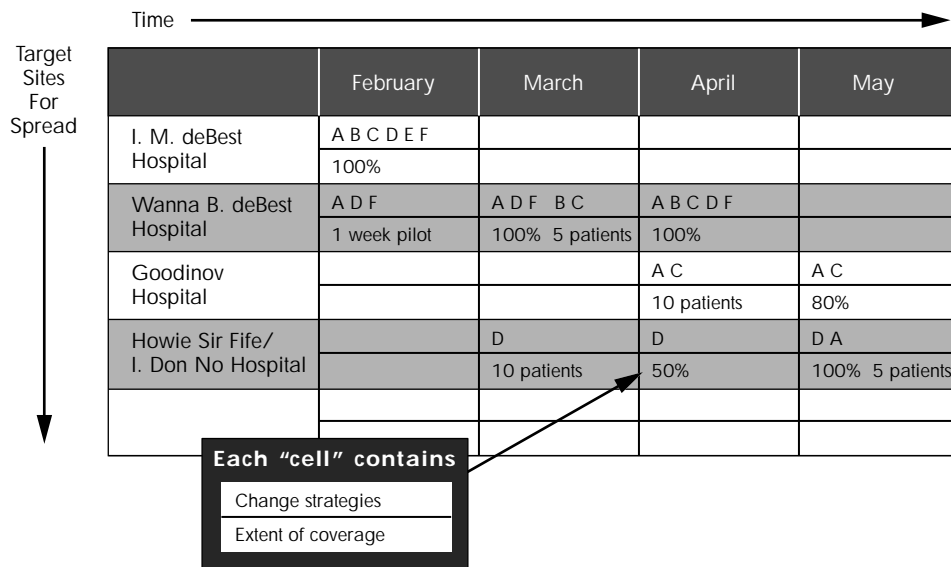


Figure 6 provides a hypothetical example. In this case, we see that the I. M. deBest Hospital has fully tested and implemented six change concepts, designated A through F, at the beginning of the planning timeframe. This is the pilot site for the changes. The spread advocate plans to work with the Wanna B. deBest Hospital to help them test concepts A, D, and F in a one-week pilot in February. This will lead to full adoption of these three concepts in March, along with a trial of concepts B and C in five patients. The plan is that by the end of April, five of the six change concepts will have been re-invented and fully adapted for use at this site. The plan goes on to indicate the diffusion of several change concepts at two additional target sites.

Who Might Use This Tool and When In the Process of Spread

For all but the most simple of change concepts, it is difficult to imagine any one individual having enough knowledge of the complex system to do all the planning for spread alone. Assemble a small team as you see the effort in the pilot site approaching a successful conclusion. The team should consist of a few individuals from the pilot site, someone who will take overall responsibility for leading the spread effort (see the section on leadership for spread), someone who is generally familiar with the process of improvement and spread, and several opinion-leaders from the target sites. While it is difficult to manage a working group of more than about 10 people, having at least a few opinion leaders from some of the likely early adopter sites on the team will greatly raise the perceived credibility of the planning effort. This team should plan to meet periodically throughout the spread process to reflect on and continually update the matrix. As spread successfully passes the tipping point and begins to take on a natural life of its own, this team may gradually shrink in size.

Examples of Use

Teams in the VHA Upper Midwest's successful Coaching and Leadership initiative routinely use change concepts, rapid cycle improvement methods, and spread matrices. A team at Sioux Valley Hospital USD Medical Center set an aim of reducing the caesarean rate and increasing the vaginal birth after C-section rate, while maintaining good maternal and fetal outcomes. This is a topic that has been widely addressed in several national collaborative improvement groups. There are many proven change concepts that have been successfully tested in other health care organizations. The first step of spread was to bring these change strategies into the organization from the outside.

The team at the pilot site successfully adapted and tested several change concepts using the rapid-cycle PDSA model. The pilot team and the spread executive then began construction of the spread matrix in Figure 7.

Figure 7

An example of the use of a spread matrix to spread innovations that helped reduce the c-section rate at Sioux Valley Hospital USD Medical Center.

Spread Site	July '99	Sept '99	Oct '99	Nov '99	Dec '99
Childbirth Ed Program	A, B, C, D	E		F	
Great Beginnings		A, C, D, E			
Healthy Pregnancy Program			A, C, D		
Physician Clinic- OBGYN, Ltd.				A, C	A, B, C, D, F

Change concepts to spread:

- A. Patient education about VBAC
- B. Posting of charge/cost information for physician and staff review
- C. Case management involvement in education and follow up
- D. Identification of factors influencing decisions regarding method of delivery
- E. Doula labor support program
- F. Physician team responsible for induction

The Childbirth Education program was the first spread site for the changes. They successfully tested change strategies A-D in the time period July-August 1999. In September 1999, they took on strategy E, while the spread team began working with another program, Great Beginnings, on testing strategies A, C, D, and E. In October 1999 they spread to the Healthy Pregnancy program. These initial sites were primarily nurse-led case management and patient education efforts. There was natural attraction to the change strategies in these groups, so it made sense to start the spread in these programs.

In parallel with this initial effort in the clinic, the Childbirth Education program began in November to adapt support tools leading to heightened awareness of the correlation of induction rates and potential for increased operative deliveries. This led to the establishment of a physician team to address inductions. Based on the initial success in collaboration with the OB Clinic in December, they were able to continue to spread this

new strategy into other clinics. In subsequent months, the team has continued working on further spread of these strategies into the community.

The results from these spread efforts during a specified time frame include:

- overall C-section rate went down by 47 percent
- VBAC rate was up by 32 percent
- primary C-section rate decreased by 63 percent
- maternal and fetal outcomes were maintained
- education regarding VBAC delivery was enhanced
- awareness of costs was increased
- communication and problem solving between organizations was improved

Helpful Hints for Application

Identifying target sites. It is important to think thoroughly about the targets for spread. Groups, departments, and other organizational entities that are performing exactly the same function are obvious targets. However, if we have done a good job developing a general change concept, we should be able to see many more targets for spread in places with similar processes and issues. For example, recall from the section on change concepts the example of “mobile registration while the patient flows in the process.” This concept arose in an improvement effort in the ED. Clearly, other EDs are obvious targets for the spread of this change concept. But so also are any other departments that currently have a fixed registration process before allowing the patient to proceed; for example, radiology, lab, outpatient surgery, and even clinic offices. The specific details of the adaptation of the change concept will no doubt be different in each of these settings, and after some thought we may decide that not all these potential targets are appropriate. The point is to identify a full set of potential targets and make deliberate decisions and plans. In this way, we have the potential to maximize the learning and benefit from the initial pilot of the change concepts.

The time scale. The time increment across the top of the matrix can be in days, weeks, or months. The decision will depend on resources available, how simple is the change, the readiness for change at the target sites, and so on. You will have some intuition for the appropriate timeframe based on your experience in the pilot site.

Sequencing of events. Deciding which sites to approach with which change concepts is the heart of the tool. While there is no precise formula, an understanding of the underlying theory of spread and psychology in complex systems can guide your thinking.

Recall the tipping point phenomenon and the notion that it is not necessary (and not likely) to get everyone on board in the beginning. As you look over your list of target sites, ask such questions as: Who are likely to be the early adopters? In which sites are key individuals already contemplating the need for change? Where are the opinion leaders located within the social system? Where is the natural attraction greatest for the change concepts I wish to spread?

When you have a general feel for which sites you will approach first, which will be in the next group, and which can wait until later, focus on individual sites to begin planning in more detail. Which change concepts are appropriate for this site? Depending upon how different the target site is compared to the pilot, not all change concepts may apply.

Sequence the individual change concepts within a given site. Experience in the pilot may indicate that there is a natural flow as one change concept builds on another. Or it may be that attraction and engagement of the spread site is easier for some change concepts than for others. This may be a key consideration as you get beyond the natural early adopters. You may find it helpful to first win over a site with a change concept that reduces hassle or frees up time, and then build on the momentum to tackle more difficult changes.

Availability of resources is another consideration in sequencing. If there are technical aspects of the change that require some expertise, make sure that you are not over-taxing your resource people by trying to spread too widely or too quickly. Further, realize that certain individuals from the early spread sites with good teaching skills might be able to share their newly acquired expertise and expand the resource pool; provided you schedule them early in the spread sequence. Also be sensitive to the availability of time and resources in the spread sites. Consider their strategic priorities and other current

change efforts. What else do they currently have on their plates that might make it easier or harder to take on these new change concepts? Again, the point is not overtaxing them.

Constructing the matrix. The planning envisioned here is a dynamic process. It is best done by a team, constructing the matrix on a blank wall using flexible media such as Post-it notes. Write target sites, time frames, and other information on individual Post-it notes that can be moved around as you discuss the issues of sequencing described above.

Be prepared to modify the plan based on on-going dialogue with the spread sites. You may be able to go faster than you imagined, or you may have to slow down or rearrange your plans based on unanticipated issues at the spread sites. Be bold in your plans, but realize that pushing others beyond their limits will only engender resentment.

Recall that the theory of spread suggests that it is enough initially to plan to get to the 10 percent to 20 percent tipping point in adoption; provided that you also set up communications mechanisms for others to observe the change process. Plan as you go. Make clear plans for the first few sites and set up ways for the remaining sites to be kept informed. When you have things going well in the first few sites, begin planning for the next batch, and so on.

Source and References

The spread matrix is a natural extension of the common financial spreadsheet or project management grid.

Social Networks and Opinion Leaders

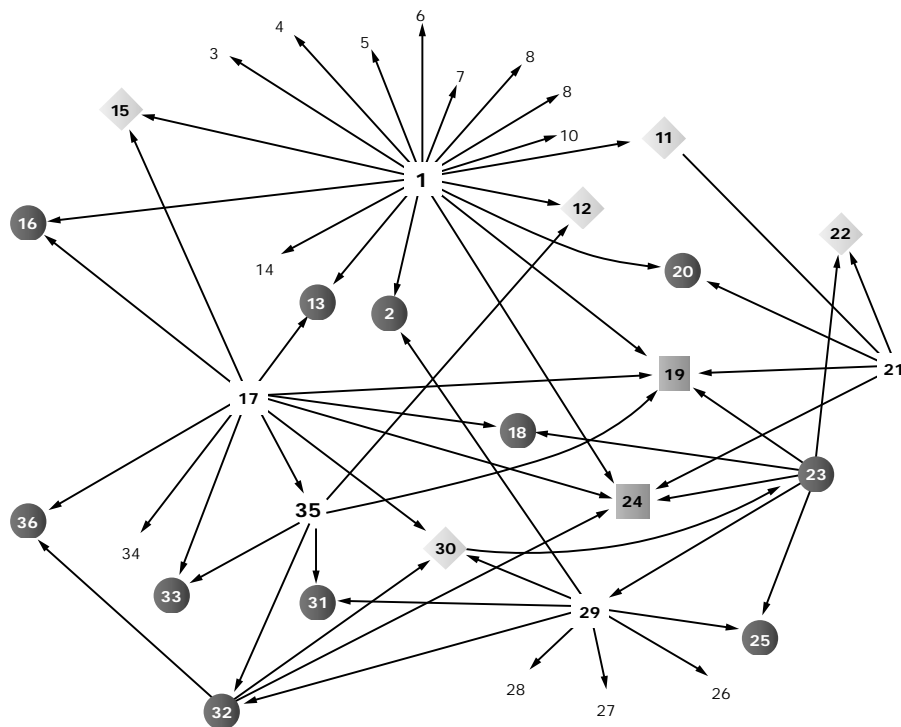
Introduction and Tie to Theory

Every change has both a technical and social aspect. Rogers' research confirms the importance of social networks in spread. The threshold for change is overcome when early and late majority individuals begin to hear about the success of the idea from a few early adopters. Social network researchers have mapped these networks of respect, trust, and friendship in a variety of situations. Social scientists refer to these networks as the "social capital" of the system.

Individuals with many contacts within the system are critical opinion leaders who can either greatly aid or hamper the spread process. We also know in health care that different professional groups can have their own relatively independent networks—an opinion leader nurse may not carry much weight with physicians, and vice versa. Further, respect and trust is topic dependent. An opinion leader on diabetes care may have little credibility when advocating a change in another clinical or operational area.

Figure 8

A network map identifies the central individuals to whom others look to for advice.



Description of the Tool

Understanding the natural social networks in an organization is helpful as we plan spread activities. Social network maps, such as the one in Figure 8, can be constructed through a formal survey process. In essence, such surveys pose two key questions:

1. On this issue, to whom do you go to for advice that you can trust?
2. With whom do you interact regularly?

If we place the names of all the people in the social system on a blank page and then draw arrows connecting each respondent to the names of those mentioned as someone whose advice they respect, we create a respect and trust network map. Individuals with multiple arrows pointing towards them are the key opinion leaders in the system. That is, many people say that they look to these individuals for advice. We can likewise map the friendship relationships that show the natural flow of informal communications within the social system.

Clearly, we would like to involve central, opinion-leading individuals early in spread efforts. If we can understand their personal attractors and engage them in the factors noted on the Spread Potential Worksheet, they may become early adopters and thereby influence many others to adopt the change. Similarly, the central individuals in the friendship networks are those who naturally disseminate information. We can think of them as communications hubs. Keeping them informed might do more good for the observability factor on the Spread Potential Worksheet than memos or formal presentations.

This formal surveying and mapping process is expensive and intricate. Fortunately, we do not typically need such a formal process to get a practical understanding of social networks. Simply discussing the two questions above in a group and asking around a bit is often enough to give us a pretty good picture of the network within an organization. When we hear the same names repeatedly we can be reasonably sure that we have identified relatively central individuals in the social network.

Regardless of how the information is generated, the outputs of this tool are the names of key opinion leaders for all the groups involved, and the names of individuals who interact and share information with many colleagues.

Who Might Use This Tool and When In the Process of Spread

This tool can be used in conjunction with the Spread Matrix (which is typically constructed near the end of the pilot site effort). After identifying the targets for spread, begin thinking about the key opinion leaders and informal communications networks for each group involved.

Examples of Use

Examples of the formal use of opinion leaders and social network theory are well documented in many industries. In Third World countries, The World Bank considers social capital as important as investment capital and infrastructure building. For example, building women's health clinics will do little good if the elders of the village believe that some practices are counter to social mores or religious beliefs. Pharmaceutical and medical equipment companies maintain elaborate databases identifying opinion leaders in local medical communities. This intelligence is used extensively in marketing new drugs and procedures. There is extensive literature on the use of opinion leaders in disseminating new medical practice guidelines. Guideline committees are often composed of those thought to be the opinion leaders on the topic at hand.

Savvy leaders have intuitively known for years about the use of opinion leaders in times of change. The physician leader of quality at a VHA hospital on the East Coast reports that he routinely seeks out and defers to opinion-leading colleagues. He often crafts improvement projects around these individuals to enhance their visibility and to link them to the organization's general efforts at improvement. The key concepts of quality improvement spread faster throughout the organization when they seem to be endorsed by highly respected clinical leaders, actively participating in projects.

One of the organizations in the VHA Upper Midwest Coaching and Leadership effort sought to spread a variety of change concepts leading to better patient access for physician office visits. The lead physician and nurse from the pilot site were both well-respected individuals. They set up a table outside the hospital cafeteria at lunch and for several weeks caught colleagues as they exited. These one-on-one conversations both spread the word about the changes and lowered the threshold for change by addressing fears. Several physicians invited the nurse to come to speak to their office staff. The added benefit of these conversations was that they gave the pilot group a better feel for who were the likely

early adopters. This information drove the development of a Spread Matrix and resulted in a steep ramp up in the number of clinics engaged in advanced open access change concepts.

Helpful Hints for Application

Opinion leadership may or may not correspond to formal position in the organization. In fact, in some professional groups, individuals who accept formal organizational roles may actually lose some of the trust that others once had in them, and they may also lose some opportunities for friendship/contact.

The central individuals in the trust network (opinion leaders) are not necessarily the central individuals in the friendship network (communications hubs.) For one thing, opinion leadership is topic dependent, while communications is more a matter of contact and opportunity. Opinion leaders can sometimes be isolated individuals or loners; particularly if they earned their respect through a very focused work ethic. While others may like the outgoing nature of a friendly communications-hub person, such individuals can sometimes get a reputation for passing on anything they hear without much critical filtering. The key point is that both types of individuals are important in the spread of ideas. Communications hubs carry the news of an idea, and opinion leaders help others get over the risk-threshold and give it a try. You will want to find ways to involve both in your efforts.

Opinion leaders are typically either your strongest allies or your worst enemies. They are rarely fence sitters. They are trusted opinion leaders precisely because they have strong opinions. It is therefore best to seek them out early in the process. Meet with them privately or in very small groups. Opinion-leaders typically do not like being put on the spot in a public forum. To do so puts their opinion leader status in jeopardy. It is a risky strategy because if they react negatively to the surprise in public, those who trust their judgment will now believe that they are against the idea. A private or small group conversation allows more room for give and take. Seek to understand their thinking on the topic. If they seem reluctant at first, stay engaged with them. Give them time to think about it. Seek to modify the idea to better fit their needs and points of view.

If the opinion leaders remain adamantly opposed to the change idea, it is unlikely that you will be able to overcome totally the sway of their objections on the social system. You can mandate compliance, of course, but that may only further aggravate a bad situation.

Fortunately, it is rare that there is only one opinion leader, or one that holds sway over an entire social system. Work initially with opinion leaders who are supportive. You may be able at least to gain partial spread. Keep the lines of communications open to the negative opinion leader. Ask other opinion leaders to work quietly behind the scenes with their colleague. Avoid public confrontations with the opinion leaders and do not engage in personal attacks. Always remember, they are the one others look up to on this issue, not you. If provoked they may lead opinion not only away from the idea, but also away from you personally as the advocate of that idea. With time, their opinion may change or soften. Consider it a victory if they become permissive of others engaging in the change, even if they themselves do not actively participate. On the other hand, we all know stories of changes that could never be made until after a key opinion leader finally left the organization. Such is the nature of complex, never as perfect as you might wish them to be, social systems.

Source and References

The literature on opinion leaders and social network theory is vast. There are good overviews in Everett Rogers' *Diffusion of Innovations*. Fourth Edition, on pages 23-34 and 281-334. Articles listed in the bibliography by Coleman, Granovetter, and Krackhardt and Hanson provide a nice variety of examples on the use of these concepts in spreading ideas.

Attractors

Introduction and Tie to Theory

Behavior in a complex system often revolves around simple attractor patterns. For example, the movements of a colony of ants over time reveals detailed behavior and many cycles of change as the insects build and then move. Paradoxically, the underlying attractors that drive this complex behavior are actually quite simple: food and survival. In human psychotherapy, it has long been known that clients are more likely to accept the counselor's advice when it is framed in ways that enhance the client's core sense of autonomy, integrity, and ideals. These are underlying attractors within the complex and ever-changing system of a person's detailed behavior.

Likewise, there are often more basic attractor patterns at work in organizational systems. Goldstein asserts that what we label “resistance to change” might be better understood as attraction to elements in the status quo. If we examine incidents of resistance and look closely at the types of changes that have spread naturally in our organization, we might be able to identify the underlying attractors in our complex adaptive system.

Linking the change we would like to spread to natural attractors in the system increases the likelihood of spread. Rogers has identified five general characteristics of ideas that spread naturally. We may be able to identify even more specific attractors in a given situation. The concept of attraction may be behind the successes of incentive systems, academic detailing, confidential data feedback, and other such approaches. Where these approaches succeed, it may be because they have tapped into natural attractors, such as the competitive nature of physicians and their desire to provide the best care.

Description of the Tool

Change is not so much about overcoming resistance as it is about creating attraction. The concept of attractors turns the idea of resistance to change completely on its head. Resistance is a natural, but potentially changeable, reaction of a system attracted to something else. Change the attractors, or tap into existing ones better, and change becomes more natural.

Observing the behavior of an organization both at times of natural change and at times of seeming resistance provides clues as to the underlying attractors. The following thinking process will help you apply the concept of attractors in your spread efforts.

- Identify a change or improvement that you would like to spread.
- Identify a group or individual that you currently think of as a “resistor.”
- What past changes have they naturally made? What are the characteristics of changes that they seem to adopt naturally? (Caution: don’t be cynical.)
- What do they seem to like most about their work?
- What do they seem to dislike?
- What do they seem to really want, deep down?
- How can you make your change more naturally attractive to them?

Who Might Use This Tool and When In the Process of Spread

This tool can be used in conjunction with the Spread Matrix (which is typically constructed near the end of the pilot site effort.) After identifying the targets for spread, begin thinking about individuals and groups involved; especially those that you suspect might “resist.”

Examples of Use

The three examples below describe attractors at various levels of the system, and at various points in the spread process.

The resistant assistant. A physician team leader in a national improvement collaborative tells of an office assistant who was resistant to a proposed change that would offer same-day appointments to patients and dramatically reduce the booking of future appointments. The assistant was attracted to the comfort of the existing scheduling process, chaotic though it was, because she understood it so well.

Rather than simply labeling her a “resistor,” the physician leader engaged her in a friendly conversation about the most appealing and unappealing aspects of her job. One prominent dislike was the process of having to call dozens of patients to reschedule appointments when the doctor was called away for a day. When the leader pointed out that the open access system would virtually eliminate the need for this activity, the assistant became actively attracted to the new idea—the same idea that she was seen as resisting just moments before.

The attractor remained the same throughout—comfort. However, where before the assistant saw the change as pulling her away from the attractor, now the proposed change was linked to the attractor. She apparently quickly weighed the two options and decided that the comfort of avoiding the cancellation calls was more valuable than the discomfort of having to learn a new scheduling approach.

The eager clinics. Another physician leader in a large VHA member organization in New York state needed to select two sites to send to a national collaborative on open access in clinic practice. In this case, the focus was on the spread of ideas from outside organizations into his own. These two sites would then serve as the pilot sites for further spread within his organization.

The usual process for selecting sites to participate in such initiatives was political in nature; identifying representative practices and making sure that everyone had equal opportunity to share in the perks of participation. In this case, the leader wanted instead to identify practices where there would be enough attraction to change to outweigh the hard work involved in making the change.

He sent out invitations to all 1,100 physicians within the system, asking those with interest to contact him. Interested sites would need to come for an interview in just a few days time. While several sites complained that this was too short notice, his goal was to identify sites that were so dissatisfied with their current performance and so attracted to the notion of change that they would enthusiastically comply, even with such an unreasonable request. Two sites were selected. A third was so eager to participate that they asked to be kept fully informed and to be the first internal spread site. The pilots were very successful in getting to the point of offering same-day appointments, increasing patient volumes, and raising patient satisfaction.

In this planning for the initial spread from the national collaborative into the local pilots, the attractor is quite straightforward. The leader was looking for sites that were directly attracted to the concept of change itself, based on dissatisfaction with the status quo.

In planning for internal spread, the leader further reflected on the potential attractors for the physicians in other clinics. In addition to reporting the improved performance results (which, of course, are attractive), his message was, “We have found a way to make life less miserable; we’re practicing smarter, not harder; our staff is happier; our patients are happier; we’re providing better care; and our finances have improved.” Here, the leader is also tapping into two common attractors among professionals: desire for a more hassle-free lifestyle and desire to focus on professional practice rather than perceived peripheral issues such as human resource and financial management.

The flexible orthopods. An orthopedic surgeon in a large group practice in Wisconsin had better outcomes than his colleagues on patients’ range of motion on the day of hospital discharge following knee surgery. The innovation that he had discovered was to place an automatic knee-flexing device on the patient immediately following the surgery. His colleagues typically waited a few days before placing the device for fear of complications.

The surgeon wished to spread the practice, and so presented his clinical rationale and data to his colleagues. He was surprised by the rejection and resistance to change he encountered.

He came back to the same group of colleagues several months later and proposed instead a randomized trial of the intervention. After some fruitful discussion, his colleagues agreed to be randomized to either immediate placement of the equipment following surgery for all their patients for the next six weeks, or staying with the existing practice of waiting before placing the equipment. Range of motion at discharge and incidence of complications were to be tracked for each group. The results were so clear after four weeks that the study was cancelled and all the surgeons switched to the new practice.

Reflecting on this case, we can see several attractors at work. The initial resistance to change was, perhaps, attraction in the status quo to risk-management and professional autonomy. The initial proposal seemed risky, and was presented in a way that seemed to say simply “look here, follow me.”

The new proposal linked to the risk-management attractor, in that it was presented as a formal study with IRB approval and consents. The fact that it was now a research study further appealed to the surgeons’ inward image of themselves as scientists; again, a common attractor in clinicians. Further, the new proposal linked into the attractor of professional autonomy, as now the surgeons were being asked to participate and could reserve the right to make up their mind based on the evidence that would accumulate.

In a way, it may seem somewhat remarkable that surgeons who would not willingly adopt a practice based on the clinical logic of the initial presentation agreed to adopt it when their names popped up in the randomization. However, when viewed from the point of view of natural attractors in the social system, it is not so remarkable.

Helpful Hints for Application

As the examples above indicate, there is an almost infinite variety of things that we might identify as attractors in social systems. Each setting, each group, and each individual will be unique at some level. Avoid stereotyping and oversimplifying.

Still, there are some common attractors that we are likely to see in our work in health care. Use the following list to stimulate your thinking as you seek to understand the attractors in your system. You may find that groups and individuals in health care are attracted to such things as:

- perform better on issues that they deem important
- direct impact on own patients (not just dry, population statistics)
- professional autonomy and choice
- appeal to social values
- scientifically generated evidence
- self-image as a scientist
- comfort
- familiarity
- hassle reduction
- simplicity
- personal status among peers
- lifestyle enhancement
- avoiding unpleasantness
- views of opinion leaders

Money is often cynically cited as what primarily motivates others. Reviewing the results of hundreds of studies, Alfie Kohn concludes that this is greatly overrated. Of course, money can serve as a surrogate for the attractor of status. But before you think cynically of those around you, just ask yourself this: If I personally did not believe that a change was right, would I do it anyway just because they paid me?

Source and References

Fritjof Capra's *The Web of Life* has short sections describing the concept of attractors in complexity science. Jefferey Goldstein's *The Unshackled Organization* provides a thorough overview of its application to organizations. The article in the bibliography by Plsek and Kilo contains a crisp overview of the main points, along with several examples of application to health care.

Certainty and Agreement Diagram

Introduction and Tie to Theory

Complexity science suggests that creativity and innovation occur in an organization at the edge of chaos; a region of only moderate certainty and agreement within the social system as to how best to proceed (see Figure 3.) As we have described it thus far, the diffusion of innovation and change is naturally a somewhat messy social-systems process that occurs in this zone of complexity. We must expect some degree of exploration and experimentation in the spread of improvement ideas within organizations. The tools that we have presented thus far aid us in this complex process.

The theory base of complexity science, diffusion of innovation, and psychology also acknowledge that in some situations change is not so complex, and we ought to “just do it.” There are indeed some ideas that we can install quite easily in a mechanical way, and there are times when individuals are quite happy simply to be told what to do. When there is a high degree of certainty and agreement that a change is a good one that simply ought to be done, continuing to labor with the social system can be an unnecessary waste of energy; what some have called over-complexification. While such simple situations are not common, it would be wrong not to acknowledge their existence and provide some tools for dealing with them.

Description of the Tool

The Certainty-Agreement diagram is a conceptual aid for determining when a change is simple, and when it is complex (see Figure 3.) Assess the change on two scales: the degree of certainty regarding cause and effect relationships in the system (i.e., evidence that the change will have the desired effect) and the degree of agreement among all the players in the system. The subjective assessment of these two factors places the proposed change in one of three regions on the diagram:

High certainty and agreement. These are changes where we should “just do it.” We know it works and everyone agrees. We simply need to put in place a mechanism to make it happen.

Only medium certainty or agreement. This is the zone of complexity where social system issues arise, and where there is a need for creativity, adaptation, and re-invention of the change. The tools and theory described throughout this document can help us in these situations.

Low certainty and agreement. Here there is chaos. No one really knows what to do, and everyone has a different opinion. Changes that fall in this category need to be tested on a very small scale under controlled conditions. The results of the test will increase certainty and stimulate the emergence of some initial agreements.

It is important to note that the diagram is only conceptual. It is intended as a discussion tool, not a precise scale or mathematical diagram. The assessments are highly subjective and are not meant to be any finer-grained than the terms low, medium, and high. The two axes are not fully independent. The goal is simply to place the change into one of the three categories described above.

It is also important to assess separately the “what” and “how” of the change. For example, there is strong evidence to support giving aspirin following acute myocardial infarction, and a group of clinicians might easily agree that it should be done. However, there can be much less certainty and agreement over just exactly how the process should be changed to assure that it happens routinely.

Who Might Use This Tool and When In the Process of Spread

Shortly after identifying a change concept, the change advocate should reflect on and discuss with colleagues the level of certainty and agreement around the change.

Examples of Use

A physician leader at a VHA member hospital was concerned about the use of a certain narcotic pain reliever in the ED. While the drugs were readily available in the ED's floor stock, recent studies pointed to higher incidence of adverse side effects and higher cost relative to equally effective alternatives. When the physician leader presented this evidence at a grand rounds presentation, there was clear agreement to limit the use of this class of

drugs in the ED. However, a review of the data some time after the presentation showed that the level of use was unchanged.

After confirming with several key physician opinion leaders that there was still high levels of agreement to stop the practice, the physician leader simply had the drugs removed from the ED floor stock and had the pharmacy fill any future orders with the alternative equivalent drugs. There was no out-cry; indicating that the agreement level was still high and that indeed this was one change that could be spread in this rather straightforward manner.

The same leader also reported, however, that a similar, simple-systems approach was used quite unsuccessfully in reducing the number of suppliers of orthopedic prosthetic devices. In this case, a small committee forged an agreement and imposed a supplier reduction without fully assessing the social system among colleagues. In a few months, the number of different prosthetic devices was back close to its previous level as surgeons found ways to justify clinically the devices they were most comfortable using. In this case, the change concept of reducing the number of suppliers in inventory failed to spread because there was only moderate levels of certainty and agreement, and the social side of change was not dealt with appropriately.

Helpful Hints for Application

The Certainty-Agreement diagram is a group discussion and thinking aid. Before you conclude prematurely that there is certainty and agreement about the change, talk with others within the system. Well-intentioned, rational individuals can honestly disagree over evidence, even from randomized controlled trials. There is even more room for honest disagreement about how something should best be done. What may seem simple and straightforward to you may not be so to others.

At the same time, be open when you hear repeatedly that you seem to be over-complexifying an issue. We have all been in situations where we and everyone around us feel compelled to cry out to our leaders “enough talk already, just do it!”

Don't forget to independently assess “the what” and “the how” of a change. Don't naively assume that because everyone seems to agree that something should be done, they also agree with your way of doing it.

Realize also that when you make a change without extensive involvement of those within the process, there is a greater likelihood that the change might be reversed later. This was the case with the surgical prosthesis. Sustaining the gains requires monitoring and on going reminders about the rationale that led to the high levels of certainty and agreement. In the end, you may need to step back and re-address the issue using the social-systems approach advocated throughout this guide.

Source and References

The Certainty-Agreement diagram was developed by British management professor Ralph Stacey. It is sometimes referred to as the Stacey Diagram or Stacey Matrix. Zimmerman, Lindberg, and Plsek's *Edgework* contains an extensive section on the tool, and several health care examples of its use.

Leadership for Spread

Complex social systems, particularly those in organizations, always have leaders. Not everyone is equal in terms of influence, power, and access to resources. Management theorist Ralph Stacey further points out that every organization has two systems of power and influence. The formal system is represented by the organization chart, but there also exists what he calls the “shadow system,” represented by opinion leadership. In successful organizations, these two systems exist in a healthy, dynamic tension. Each brings something to the table that completes the others. For example, the formal system can bring access to resources for change, while the shadow system can bring enthusiasm and creativity. Each also checks the other against excess. For example, the shadow system blocks formal change efforts when it feels that financial concerns have overtaken patient care or staff satisfaction considerations. Likewise, the formal leadership can withhold needed resources from nice ideas that do not have sufficient benefit compared to cost.

The theory and tools presented in previous sections recognize the role of the informal, shadow-system leaders. In this section, we focus explicitly on the formal leadership role, and its influence on the spread of ideas for improvement within an organization as shown in figure 9.

Figure 9

Selected elements of a framework for the leadership of spread originally developed as part of the VHA Upper Midwest Coaching and Leadership Initiative.

In order to be successful in accelerating the spread of improvement within their organizations, leaders need skills in the following areas...

- strategic aim setting
- spread thinking
- project management and “pacing”
- coaching for sustainability
- engaging others
- barrier busting and infrastructure building
- reflective thinking and learning
- building further organizational capacity for spread

Leadership Skills to Accelerate the Spread of Improvement

One reason why innovative improvements do not spread naturally within most health care organizations is that there are simply too many other things going on. Most day-to-day managers, clinicians, and staff have far too many “priorities” to allow them to actively seek out and implement innovative improvement ideas from others. Leaders who want to accelerate spread, therefore, need skills in strategic aim setting. This involves having the vision and foresight to see customer and marketplace needs, as well as internal needs.

It is not always enough, however, simply to state the aim. Leaders also need skills in engaging others around the change. The primary skills here include communication and dialogue, building energy in others, empowering, creating attraction, providing opportunities for action, coalition forming, and team building.

Leaders must possess knowledge of spread thinking. This includes all the concepts and tools described elsewhere in this guidebook, such as the research on the diffusion of innovation, complex systems thinking, psychology, effective communications, change concepts, rapid cycle improvement methodology, use of opinion leaders, and so on.

To clear the way for improvement and to create structures that actually support diffusion, leaders need skills in barrier busting and organizational infrastructure building. The skill set here includes both interpersonal skills such as negotiation and conflict resolution, and system-building skills such as budgeting, staffing, and rewarding for the spread of innovation.

Both the infrastructure building and the spread process are massive organizational projects. Leaders who want to accelerate spread, therefore, also need skills in project management and pacing. While these are related to traditional project-management and time-management skills that might be applied to the construction of new physical plans, as we have pointed out the skills in managing change in human systems are not the same. Organic change in complex adaptive systems needs a “heartbeat” that sets an aggressive, yet sustainable pace.

Because we are dealing with complex human systems within organizations, leaders of diffusion must accept that they will never figure it all out, once and for all. Leaders therefore also need the skills of reflective thinking and learning to enable them to both be certain in some situations, and adaptable in others as they guide their efforts forward.

It does little good to work to diffuse innovative improvements without also working to hold the gains from those improvements. Therefore, leaders also need skills in coaching for sustainability. Finally, leaders must recognize that they cannot do it all alone. Leaders need to manage their own personal time schedule to avoid burn-out, and mentor other leaders at all levels in order to build further organizational capacity for spread.

Organizing for Spread

Pioneering health care organizations around the country have developed formal organizational models to support faster, wider spread of improvement ideas. No single model has emerged. This is not surprising, given that each organization is a unique social system with its own history, culture, and values. Each organization will need to develop a system that works for that organization.

We do see emerging, however, some generalizable change concepts that can guide thinking as you develop your organizational infrastructure for spread.

Link spread directly to other legitimizing mechanisms in the organization.

Examples include: commissioning spread projects at the board of directors level, making spread a formal item for the administrative council or medical staff executive committee (even better, a shared responsibility of both groups), establishing formal budget lines for spread projects, and building measurable expectations for spread into performance appraisals at all levels of the organization.

A word of caution is appropriate here. Spread is a messy social process. If formal goals, plans, and constraints are too rigid or machine-like, there will be a temptation for leaders to skim over the social system issues under pressure to perform. This will ultimately undermine the effort and make gains unsustainable. The complexity management concept of “good enough vision and plans” is helpful here. Look further to the example of the champion athletes who sets unrealistically high goals, but then celebrates the facts that they performed better than the last time out and recognizes what they need to work on to be even better next time around.

Use a project approach. While the ultimate goal is to make the spreading of good ideas a natural habit in the culture of the organization, pioneering organizations are finding that a project approach initially provides a focused and highly visible learning environment for new skills and methods. This approach is consistent with the addiction psychology literature, and the complex systems concepts of chunking and providing boundaries. Consider, for example, having a formal chartering document, establishing a multi disciplinary spread team to oversee each effort, and setting up a project milestone-reporting procedure.

An organization’s experience with quality improvement projects is a good guide here. Reflect honestly on what was helpful, and what was not, in setting up past improvement projects. Sadly, in many health care organizations, well-intentioned elements of project infrastructure often do more to slow down and drive people away from improvement. Strip down your experience with these projects to the bare bones and challenge every aspect of formality as to its ultimate usefulness. Get down to the minimum specifications for the formal requirements of a “project.” Aggressively challenge needs for “controls” on the process. Retain only those elements of project infrastructure that truly benefit those who are doing the work.

Assess and build readiness for change. Except for only the most extreme situations, all change in human systems is ultimately voluntary. Forcing the spread of a change onto a largely unwilling organization builds resentment that makes that change, and all future change, hard to accomplish. Many pioneering organizations use assessment instruments, such as the Organizational Change Manager, developed by Dr. David Gustafson and colleagues at the University of Wisconsin, and used in VHA’s Clinical Advantage initiative. If readiness is not high, take the time to build it. Relative to the ultimate goal of spreading the change, this seeming delay is a better use of time than succumbing to the pressure to roll out the change against the tide of lack of awareness

of the need, apathy, or outright opposition. At the same time, keep in mind that you may only need readiness in a portion of the target population in order to reach the tipping point where the idea begins to spread quickly on its own.

Recognize the shadow system, without destroying its independence. Seek out and involve opinion leaders and communications hubs. Pioneering organizations take a variety of actions with these individuals such as: making them team leaders, putting them on steering committees, featuring them prominently in communications about the effort, freeing up some portion of their time for direct involvement with pilots and spread sites, targeting the departments they work in early in the spread process, and so on.

It is important, however, to recognize the delicate nature of the shadow organization. Others often trust opinion leaders precisely because they maintain an independent point of view. Too much formalizing of their role as leaders can erode their leadership and leave open the door for others to step in with an opposing point of view. Therefore, go out of your way to give your opinion leaders independence, within broad bounds. Let go of control and defer to their leadership. Avoid public confrontations. If you find that you disagree on a matter, discuss it in private or in a small group. Do not take them too far away, for too long a time, from the work for which they are respected. Make it a real partnership on their terms.

Match the personalities and skills of individuals with the needs of the various phases of the spread effort. Rogers points out that innovators, early adopters, and the majority have different personalities. It is rare that an individual is equally effective in providing leadership throughout the life cycle of the spread of an idea. The innovator, with creative and energetic style, can become bored with the details of spread, frustrated with colleagues who just don't seem to "get it," and annoyed when others will not acknowledge the correctness of the specific way they did it. While the early adopters might enjoy the often quirky personality of the original innovator, that same innovator can become the very worst spokesperson for the idea as it moves through the social system. Organizations that are mastering the art of spread recognize this dynamic and make deliberate plans to support innovators to move on to their next big idea. They identify early adopters who are willing to accept the innovator as a mentor, and who have the skills to translate the idea in ways that engage the slightly more skeptical early majority.

In health care, we are just beginning to see leading organizations take a deliberate approach to the spread of good ideas for improvement. No doubt, more change concepts for leadership will emerge over time. The best guide for the way forward on this issue is an honest reflection on the efforts of the past. Successful leaders will apply improvement thinking, with the concepts of reflective practice embodied in the PDSA cycle, to the process of improvement itself.

Communications and Observability of Change

Introduction and Tie to Theory

Ideas spread within a social system when individuals have the opportunity to learn about them and watch others make the change. Rogers points out that observability is a key characteristic of ideas that spread naturally.

Tips on Communication

Harvard organizational-change expert, John Kotter, advises change leaders to “overcommunicate by a factor of 10.” He points out that members of an organization are constantly receiving signals in the environment that indicate what is important. These signals come in the formal guise of memos and presentations, but also in the more subtle forms of hallway comments, who gets promoted or appointed to key roles, what leaders spend their time doing, and so on. These latter forms of communication often drown out the formal communication mechanisms. A single memo, presentation, or site visit has little chance of getting through the noise. Leaders who rely on such minimal communications should not be surprised when busy professionals and staff say that they were unaware of change efforts going on around them. A good communications plan for spreading a new practice should broadcast a consistent message through a variety of mechanisms repeatedly over time.

A good guideline is that you know you have communicated adequately about a change effort when you find people stopping you in the middle of your explanation to say, “Enough already, we’ve heard about this, when are we going to start doing it!?!”

If you want an idea for improvement to spread, use every means at your disposal to spread the word about it. The list below is meant only as a starting point to stimulate your thinking about ways to get the message out:

- utilize traditional methods such as staff meeting presentations, memos, and bulletin board notices
- display posters presentations in conspicuous areas
- submit on going series of articles in employee newsletters
- develop a special newsletter for the duration of the spread effort
- create broadcast e-mail or voice-mail updates
- develop prominent display of progress, such as you might do in fund-raising
- organize informal discussion groups and updates over lunch and breaks
- organize one-on-one discussions; systematic or whenever the opportunity presents
- arrange personal invitations to opinion leaders to visit the pilot and early spread sites
- arrange visits to spread sites by opinion leaders and those involved in the pilot
- identify the spread effort on the standing agenda of other, routine meetings
- develop a videotape and let it run continuously in a conspicuous area
- produce an audiotape and suggest that people listen to it while driving
- make participation an explicit part of performance appraisal
- reinforce continual mention by senior leaders; whenever they speak to any group

Be creative! You will get more attention, and therefore more chance of getting through the organizational noise, if you come up with a few unique communications mechanisms, in addition to the routine ways that you normally communicate.

Remember Kotter's advice. Don't be afraid of over doing it. Use multiple means of communication and multiple spokespersons. Most change leaders dramatically under do communications, and their efforts suffer for it.

Action Steps, Getting Started

It is a natural urge to imagine that the first thing to do is to organize at a senior level to place more focus on spread. After all, improvement effort is being wasted and the need for change is strategic. It is a natural urge, but we think that it is the wrong urge.

Rather, the thinking and tools described here need to spread within the social system of your organization like any other idea. You need some early adopters. You need to test, adapt, and reinvent. You need to demonstrate relative advantage and allow for observation. Forming a senior-level committee and linking these efforts immediately to strategic planning and budgeting processes may lock you into sub-optimal ways of doing things and more bureaucracy.

Referring back to the five change concepts for organizing of spread in the Leadership section, we suggest that you work first with the concepts: Use a project approach and recognize the shadow system, without destroying its independence. Form a small group of colleagues whom you feel are ready to be early adopters. Share and discuss the material in this guide. Review several improvement projects that have been recently completed, or are well on their way to success, to find a good candidate with whom to begin a focused look at spread. If you have recently sent teams to collaboratives, these may be good candidates for spread. You are looking for a project in which there are change concepts that clearly should be spread and an existing improvement team that is eager to do more. You might want to explore with several such groups before you decide.

Meet with some members of the team and learn more about the changes they made and the results they achieved. Develop with them some change concept statements. Brainstorm about potential targets for spread. Maybe even construct a concept fan around one or more change concepts to get them to see the possibilities and to gauge their willingness to let go and think of other ways beyond just what they specifically did. You should also quickly assess the change concepts on the Certainty-Agreement diagram.

When these initial discussions yield a good candidate or two, use the Spread Potential Worksheet to reflect on the likelihood for spread and what you might do to enhance it. You may need to spend a few weeks on such enhancements before you begin serious thinking about spread.

The Spread Matrix is the next obvious tool. Just pick a few good spread sites that you believe will be willing. Of course, you should work with obvious sites, but also try to select one site that is not so obvious yet the change concept applies. For example, obviously you want to spread mobile registration to other EDs in your system, but also work with the outpatient surgery center or radiology department. Your goal is to demonstrate to others how wide the need is for a more focused approach to spread. Talk about the shadow system, the social networks, opinion leaders, attractors, and so on. Make a plan for approaching these sites.

Remember to use the Spread Potential Worksheet on your own efforts. What data do you need to collect to show the advantage of these spread planning methods? How will you do this in ways that are consistent with organizational values? How can you increase the observability of the effort?

Conduct two to three rounds of this project by project approach, capturing your learning along the way and getting an ever-increasing group of early adopters. Shield your efforts from critics. Work with the willing and always keep in mind the tipping point phenomenon. You and your small group of colleagues should be able to assemble an impressive array of examples of your own over a year. It is really not too long to wait and learn before you risk placing too much structure around it.

With these initial successes and learnings, work next on the organizing change concept: Link directly to other legitimizing mechanisms in the organization. Again, keep the principles of attraction and working with the willing in mind. You will have some insight from your initial efforts as to how you might best organize all this to assure success with minimal bureaucracy. Let the system emerge as you go.

The concepts and methods presented in this guide are powerful and desperately needed in health care today. We can improve much faster by tapping into what others have already learned. And we can do it without all the struggle engendered in the phrase “resistance to change.” We can make improvement attractive. We can use organizational momentum in a positive and constructive way, rather than complaining that everyone seems stuck in their ways. Just as we have mastered in the past several years the methods of basic improvement, we can now build in these methods for spreading what we know. We can turn our organizations into pools of water in which ideas diffuse as naturally as a drop of color.

Bibliography

Diffusion of Innovation

- Coleman J., *Social Capital in the Creation of Human Capital*. *American Journal of Sociology*, 1988, 94: 95-120.
- Gladwell M., *The Tipping Point: How Little Things Can Make a Big Difference*. New York: Little, Brown, and Company, 2000.
- Granovetter M., *Threshold Models of Collective Behavior*. *American Journal of Sociology*, 1978, 83: 1420-1443.
- Krackhardt D. and Hanson J.R., *Informal Networks: The Company Behind the Chart*. *Harvard Business Review*, 1993, 71(4): 104-111.
- Rogers E.M., *Diffusion of Innovations*. Fourth Edition. New York: Free Press, 1995.
- Valente T.W., *Network Models of the Diffusion of Innovation*. Cresskill, NJ: Hampton Press, 1995.
- Van de Ven A.H., Polley D.E, Garud R, and Venkataraman S., *The Innovation Journey*. Oxford, England: Oxford University Press, 1999.

Psychology of Change

- Argyris C., *Overcoming Organizational Defenses*. Boston, MA: Allyn & Bacon, 1990.
- Beckhard R. and Harris R.T., *Organizational Transitions: Managing Complex Change*, Second Edition. Reading, MA: Addison-Wesley, 1987.
- Bridges W., *Managing Transitions: Making the Most of Change*. San Francisco: Perseus Press, 1991.
- DiClemente C.C. and Prochaska J.O., *Self-Change and Therapy Change in Smoking Behavior: A comparison of processes of change in cessation and maintenance*. *Addictive Behaviors*, 7, 133-142.

Complexity Theory

- Anderson P., *Seven Levers for Guiding the Evolving Enterprise*. In Clippinger J.H., *The Biology of Business: Decoding the Natural Laws of Enterprise*. San Francisco: Jossey-Bass, 1999.
- Brown S.L. and Eisenhardt K.M., *Competing on the Edge: Strategy as Structured Chaos*. Cambridge, MA: Harvard Business School Press, 1998.
- Capra F., *The Web of Life: The New Scientific Understanding of Living Systems*. New York: Anchor Books, 1996.

- Lewin R. and Regine B., *The Soul at Work: Embracing Complexity Science for Business Success*. New York: Simon & Schuster, 2000.
- Plsek P.E. and Kilo C.M. *From Resistance to Attraction: A Different Approach to Change*. *Physician Executive*. 1999, 25:6, 40-46.
- Stacey R.D., *Strategic Management and Organizational Dynamics*. London: Pitmann Publishing, 1996.
- Zimmerman B.J., Lindberg C. and Plsek P.E., *Edgework: Complexity Resources for Healthcare Leaders*. Dallas, TX: VHA Publishing, 1998.

Other General References

- de Bono, E., *Serious Creativity*. New York: Harper-Collins, 1992.
- Flamm B.L., Berwick D.M., Kabacoff AI. *Reducing Cesarean Section Rates Safely: Lessons from a Breakthrough Series Collaborative*. *Birth* 25(2): 117-124, 1998.
- Goldstein J., *The Unshackled Organization: Facing the Challenge of Unpredictability Through Spontaneous Reorganization*. Portland, OR: Productivity Press, 1994.
- Henley N.S., Pearce J., Phillips L.A., Weir S., *Replication of Clinical Innovations in Multiple Medical Practices*. *Joint Commission Journal on Quality Improvement*. 24(11): 623-639, 1998.
- Horbar J.D., *The Vermont-Oxford Network: Evidence-Based Quality Improvement for Neonatology*. *Pediatrics*. 103:350-359, 1999.
- Kohn A., *The Brighter Side of Human Nature: Altruism and Empathy in Everyday Life*. New York: Basic Books, 1990
- Kohn A., *No Contest: The Case Against Competition*, Revised Edition. New York: Houghton-Mifflin, 1992.
- Kotter, J.P., *Leading Change: Why Transformation Efforts Fail*. *Harvard Business Review*, March-April 1995: 59-67.
- Langley G.J., Nolan K.M., Nolan T.W., Norman C.L., Provost L.P., *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. San Francisco, CA: Jossey-Bass; 1996.
- Plsek P.E., *Creativity, Innovation, and Quality*. Milwaukee, WI: ASQ Quality Press, 1997.
- Plsek P.E., *Innovative Thinking for the Improvement of Medical Systems*. *Annals of Internal Medicine* 131(6): 438-444, 21 September 1999.
- Plsek P.E., *Quality Improvement Methods in Clinical Medicine*. *Pediatrics*. 103: 203-214, 1999.
- Sackett D.L., Richardson W.S., Rosenberg W., Haynes R.B., *Evidence-Based Medicine: How to Practice and Teach EBM*. Edinburgh: Churchill-Livingstone, 1998.

About the Author

Paul Plsek is an internationally recognized consultant on improvement and innovation most of whose efforts are in the health care industry. His work with leaders can be described as “helping organizations think better.”

Before starting his own firm, he led engineering teams in Bell Labs and was director of corporate quality planning at AT&T. Paul is a Senior Fellow at the Institute for Healthcare Improvement, serves on several editorial boards, and is active in research projects with the Harvard School of Public Health and the Vermont-Oxford Neonatal Network. He is the author of dozens of journal articles and three books: *Quality Improvement Tools*; *Creativity, Innovation and Quality*; and *Edgeware: Insights from Complexity Science for Health Care Leaders*.

He has been an active participant in many VHA activities including his current role as faculty for advanced learning collaboratives on the topics of diffusion and spread of improvement in VHA's Clinical Advantage program.