

# Ten Complexity Principles for Leaders for Thriving in the Quantum Age

Do not go where the path may lead, go instead where there is no path and leave a trail.

—Ralph Waldo Emerson

## Chapter Objectives



*At the completion of this chapter, the reader will be able to*

- Analyze the key characteristics of complexity and their impact on the leadership role.
- Evaluate personal characteristics and their fit with the leadership skills needed in the sociotechnical age.
- Formulate personal goals for adapting to the leadership role in the presence of chaos and complexity.
- Summarize the principles of complexity and describe their practical implications for the leadership role.
- Apply the principles of complexity theory to the personal exercise of leadership.

Ours is a time of significant social, cultural, and economic transformation (Brewer & Sanford, 2011). New scientific foundations grounded in the concept of complexity and its impact at every level of existence have altered our understanding of the leadership and management of change. The growing understanding and explication of quantum theory and the subsequent application of complexity and chaos theory to human organizations have altered the nature of leadership forever. Leaders must now more deeply understand the implications of complexity theory for the leadership role and for the processes associated with transforming work and the workplace. The principles of complexity theory largely determine how best to help others own their own change, undertake the right change processes, and understand the new rules of engagement in this postindustrial age.

Throughout the world, people are being overwhelmed by their work, the pace of change, the limitations on their time, and the endless advance of technology and the related social changes (Nelson, 2009). Especially now, health care is experiencing severely increased demand for transformation in an environment of severely diminished resources. Reflecting the many demands of health reform, the pace of change is so rapid that many healthcare leaders have left the field and many health professionals are considering whether to follow. Several factors operate to create this situation:

- *Change is endless.* In the “good old days,” it seemed as though changes came in an ordered fashion and with enough time between them to allow people to adjust to the new demands. Indeed, because changes came so rarely and moved so slowly, people almost believed they created them rather than responded to them. Today, changes come so quickly that it is difficult to know when one change ends and another begins. Further, five or more changes may be unfolding at one time, and because people must deal with these changes simultaneously, they often do not know how they are doing or if any of the changes are sustainable. They may be confronted by so many changes and may be making so many changes that they wind up changing the changes. Stephen Hawking stated, “Change is,” by which he means that change is a constant. Change is not a thing, but a dynamic, a context for everything that happens in the universe. During a time of transition, forces converge to make it possible for many changes to occur simultaneously. What is most striking about the nature of change today is the large number of forces converging and the large number of changes unfolding at the same time.
- *The growing social, political, and economic forces driving contemporary health reform and transformation to reflect a stronger value orientation accelerate the requirement to embrace and engage entirely new notions of healthcare service and value.* The transformation of the healthcare system requires movement out of a predominantly tertiary care model of service delivery toward more general use of value-driven models of episodic, population, and continua of care services. Approaches to accountability, value, and affordability require a new level of consciousness between provider and user and significantly different approaches to designing health care, providing service, advancing health-based outcomes, and creating a sustainable and affordable framework for health delivery in the United States. All of this requires the capacity to reconceptualize approaches; define new methods and models of care delivery; evaluate effectiveness, value, and sustainable health outcomes; and reduce the untenable cost of health service. When linked and integrated, the degree of complexity and intensity invested at every level of leadership and service in health care has few historic parallels. Challenges associated with this major transformation are constant and operate at both the collective and individual levels of leadership.
- *Information is remarkably more available than in the past.* Previously, the amount and kind of information needed at work were rarely readily available. Today, the vast amount of data on hand makes it very difficult to distinguish what is relevant and valuable. The goal is not simply to find the right information, but to find it at the right time in the right form. Indeed, too much information is just as much a hindrance as too little.

Making good decisions is still a matter of choosing data carefully. Further, this is the Information Age, which means that information is the key to sustaining integrated activities and assessing their value and impact. The importance of information has in turn affected the content and manner of decision making. Clinicians, for example, rather than depending solely on traditional medical principles and human judgment, now must draw from increasingly complex categories of evidence-grounded information in their decision making.

- *Knowledge is more a utility than a capacity.* In the twentieth century, knowledge was treated as a possession: One had knowledge or gained knowledge. The process of learning was essentially a process of “stuffing” facts into one’s head. As a result of this process, the knowledgeable person possessed knowledge and could draw from it when necessary. Today, however, from the quantum perspective we see knowledge as a utility. Because so much information is available, no one has sufficient capacity to acquire all the knowledge he or she will need. Thus, the focus has shifted from possession to access. To use knowledge appropriately, people must be able to access the right knowledge at the right time in the right way for the right purpose, apply the knowledge wisely and well, and then let the knowledge go when it is no longer relevant (Hildreth & Kimble, 2004). The current challenge for leaders is to recognize that knowledge is a utility and to develop the skills needed to access knowledge in the fundamentally new context for knowledge management (Maliszewska, 2013).
- *Technology is changing the character and content of the service relationship.* Virtually nothing has changed the circumstances of life as radically as the application of new technologies. Most of us confront technologies that we read about in science fiction novels and assumed we would never live to see. Twenty years ago, the average length of stay for hospital services (the only healthcare services available) was 5.7 days. Today, the average length of stay for many high-tech services is 4.5 hours. What a dramatic change for the providers and users! Technology affects all the elements of service. Procedures once done only in a hospital under close supervision can now be done in a clinic or even at home. Laser therapy, CT scanners, nanotherapy, DNA-moderated interventions, and micro therapeutics, to name a few, are signs of the radical shift occurring in the delivery of services. The shift is still in its formative stages, with much more to come as a result of improvements in pharmaceuticals, technotherapeutics, and the application of genomics.
- *Wireless technologies now operate in a way that defies boundaries.* We live in a boundary-less world, with all that that implies. This sense of universal collectivity changes the perceptions of differences, boundaries, and barriers and allows each of us to remain connected to anyone, no matter where in the world we live. We can take our technology into any location, no matter how isolated, and still be connected to every other part of the world. This sense of the world and our connection to it has led to global communities of work, entrepreneurship, innovation, communication, and social enterprise (Marshall, 2009). New kinds of international partnerships and models that connect people and systems and challenge old constructs of boundary, be they national, regional, work related, organizational, or social, are emerging.

The preceding list merely indicates the dramatic changes that affect health care and other arenas of social existence. Further, the pace of these and other evolving and revolutionary changes is not likely to slow any time soon. The quantum, complex, even chaotic nature of change as the convergence of forces periodically brings about an age of transition, and that is exactly what we are living through now.

## Chaos and Complexity and the Dance of Change

The interacting and intersecting character of complexity draws us into a web of relationships and understanding that will ultimately change our way of living. From strange attractors to webs of influence and relatedness, the elements of complexity theory alter the rules of work and interaction by giving us a deeper understanding of the relatedness of things and the role of change and discernment in human progress.

The strange characteristics of complexity are embedded in human activities as well as physical processes. An item at one level of reality is affected by everything else at

### Key Point

Understanding complexity is requisite for understanding relationships. Complexity science teaches us that everything is related at some level.

all other levels. Sometimes we can see and understand the causal process. In most cases, however, the cause is not transparent and requires special knowledge to be understood. In addition, because of the connection of all elements of any process, the observation of the process affects what takes place, as evidenced by the wave-particle duality of electrons, which

explains how electrons exhibit wave characteristics or particle characteristics depending on the experimental arrangement.

The impact of leadership often depends on the amount of time the leader spends living in the potential. Schrödinger's cat, a famous thought experiment intended to illuminate the difference between actuality and potentiality, helps us understand the importance of leaders applying the principle of the potential to their own role. In 1935, Schrödinger used an imaginary scenario to illustrate a quantum mechanics problem. He posited that a cat might at one time be both alive and dead depending on an earlier random event. In the experiment, a cat, a flask of poison, and a radioactive substance are placed in a sealed box. If an internal monitor detects radioactivity, the flask is shattered, releasing the poison that ultimately kills the cat. Schrödinger's interpretation of

### Point to Ponder

How many leaders realize that their primary work is to help others deal with the changes that affect their lives and their work? Living in the potential for change is focusing on the "journey" of work rather than on the "events" of work. This journey should be a leader's primary focus.

quantum mechanics implies that, after a while, the cat is simultaneously alive and dead, yet when we look in the box, we see the cat either as alive or dead, not both. The question is: When exactly does quantum supposition end and reality collapse into one possibility or the other? These rather complex notions indicate that things are not always what they appear to be. In a state of quantum

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## Exhibit 2-1 Actual Versus Potential Reality

### Living in the Actual

- Focus on the present
- Living the experience now
- Focus on good process
- Key is work quality
- Emphasis on current activity
- People focus on their own work

### Living in the Potential

- Inclusion of coming events
  - Seeing the work as journey
  - Focus on good outcomes
  - Key is right results
  - Read “signposts” of change
  - People focus on team
- 

entanglement, the states of two systems that once interacted and then separated may not be divided each into their own definitive state. This interpretation of quantum mechanics implies that the states of two systems collapse into a definite state when either one of the systems is measured.

Actual reality is the state in which most of us live; it is where we perform our actions out of awareness of the present. We live actively in the present and attempt to meet the demands that lie right in front of us and that define our experience in current time and space. Potential reality, though just as real and current as actual reality, has different characteristics (**Exhibit 2-1**). Living in the potential means being aware of a reality that is not present but that is inevitable because of the prevailing circumstances or the force of its trajectory. A good example is the standard stop sign placed at intersections. When a driver sees the sign, he or she understands what it means and is willing to respond to it appropriately. However, the driver does not stop immediately because that would be an inappropriate (or untimely) response. The sign is a symbol of potential reality in play; action is inevitable but does not occur instantly.

## Group Discussion

Sue Craft loves the details of managing her department and tends to focus on the staff issues of the day. There does not seem to be a problem beyond her abilities, and follow-up is her specialty. Sue has noticed, however, that more problems than usual are emerging. Although she is not certain where all of them are coming from, a lot more changes are originating “up there” than usual, creating more daily problems. She is beginning to feel overwhelmed. Discuss the options available to Sue for dealing with the increase in problems. Consider the following questions: Is her focus on the problems that arise daily appropriate for someone managing a department? How might her leadership role be altered to help her handle the large number of changes being handed down by the higher levels of management? How might Sue change her orientation to be better in touch with future issues?

Leaders are good signpost readers. They understand what the signposts indicate about the journey and act on them only as the circumstances dictate. Good leaders have what

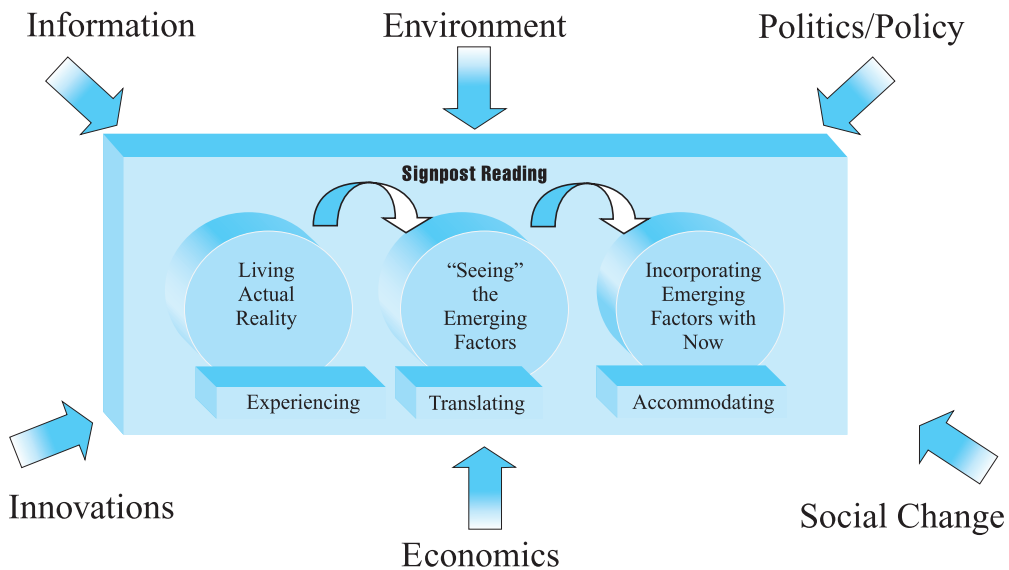


Figure 2-1 Seeing the Journey into the Future.

is called predictive and adaptive capacity. This is the ability to see and understand the interface between environment, organization, and persons and to predict the impact that interface has on action. From the perspective of action, the leader can predict the trajectory that lies ahead and adapt practices and behaviors that best demonstrate the convergence between the demands of the environment and the trajectory of the journey. Leaders' ability to anticipate which actions will be needed, through accurate reading of the signposts (predictive and adaptive), is one of the keys to good leadership. It also demonstrates living in the potential (Figure 2-1).

How many organizations have been led by people who live so thoroughly in the actual that they are unable to anticipate events far enough ahead of time to allow for an effective response? How many organizations merely react to one crisis after another because the power of the potential is not incorporated into the leadership role in a way that enables it to be applied properly and at the right time?

Living in the potential requires leaders to recognize that they are managing a journey and thus need a specific set of predictive and adaptive skills. Leaders who have been raised on the twentieth-century model of leadership tend to focus on the goal or end-point and implement activities that will get people to that goal. In a chaotic period, when deconstruction occurs at the same rate as construction, or even faster, the dust of change makes it difficult for leaders even to see the goal. Instead, they must read the signposts of change, understand how they indicate the trajectory of decisions and actions, explain to others what they mean, and engage others in activities that move the organization in the direction indicated (Heifetz & Linksy, 2002). Two skills are critical here: the ability to read where the change is occurring and determine the right responses, and the ability to anticipate the next signpost early enough to evaluate current progress and determine

one signpost's relationship to the next one (adaptation). In short, leaders need to respond fluidly to current demands and changing circumstances, remain open to the messages carried by longer term indicators, and act in accordance with these messages (Das, 2013).

Many leaders get sucked into the concerns of daily work (actual reality) to such an extent that they lose sight of the potential. When leaders focus their energies on daily activities, they are not able to discipline these activities in the light of imminent influences or circumstances. In many, if not most, organizations, the ability of leaders to engage their own future at the right time is frequently compromised by the fact that they never saw it coming. All eyes are on the activities of the moment, which consume everyone's attention and prevent anyone from seeing the emerging shifts and circumstances that will ultimately affect the organization's ability to thrive.

Many authors, from Nicholas Negroponte (1995) to Kevin Kelly (1995), have delved into the dynamic of complexity to make it understandable and applicable to human enterprises. They have derived certain principles for and a number of insights about the coming age and how to navigate it. The remainder of this chapter presents rules that can help leaders consider the leadership role and separate out the activities that best match the demands of the new world of work (Crowell, 2011; Uhl-Bien & Marion, 2008).

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## Principle 1: Wholes Are Not Just the Sum of Their Parts

Wholes are made up of smaller units that interact with each other to sustain the whole.

In the twentieth century, managers believed they had to focus simply on the units of work for which they were responsible. They were evaluated within the context of their own units of service, and if they did well in those units, managed the workforce well, and advanced productivity and profitability, they were rewarded and sometimes even promoted.

In a systems mind-set, any service unit is looked at as a part of a broader context that gives the unit direction and purpose. A unit does not simply provide services independently of its relationship to other parts of the organization. Each unit, at some level, is required to ensure that what it does fits well with the activities of the other units. According to systems theory, the fit between the components of a system is as critical as the work of any one component. This notion of goodness-of-fit is what drives the understanding of the relationship between the whole and its parts. The whole is not simply the sum of its parts; it is instead the representation of the interface and coordinated interaction and integration of all of the parts in a synergy and fluidity of relationship, interdependence, and collective support.

The most common problem in systems is that a unit and the people that make it up get co-opted by their work and their intentions. Because they leave their work and relationships within the context of the unit, they forget that whatever they do has a broader frame of reference that must be taken into account in assessing the viability of their work.

### Key Point

Leaders need to focus on issues of "fit." They live in the "white space," the connections, most of the time and must constantly attempt to see where the intersections are and how they facilitate the work of the system.



An organizational leader must always keep the focus on the organization's broader purpose. The leader's role is to ensure that there is a goodness of fit between the activities of those at the point of service and the overall work of the organization. This takes considerable doing, especially when the leader also must pay attention to the kind and quality of work done at the point of service. Being present at the point of service can cause the leader to get caught up in the day-to-day activities of the service and to forget the ultimate goals toward which these activities are directed.

### Group Discussion

Systems are different from institutions. Systems thrive on relationships and intersections, and models of systems reflect relationships rather than control. Discuss the effect that a systems orientation would have on the design of a healthcare facility. Draw an organizational chart to reflect relationships instead of functions, including relationships to the community, other services, other health systems, and so on. Finally, discuss the differences between leading a facility that is a system and leading a facility that is an institution.

Leaders are responsible for seeing and living “systemness.” The differences between institutions and systems are significant (**Exhibit 2-2**). In institutions, most of the work is compartmentalized and organized vertically, which, together with the focus on process, creates a clear separation among the various loci of work. Because the focus is on results at the point of productivity, special roles are created to address the issue of fit. Yet those responsible, from managers to specialty engineers, are not located where most of the work is done, and those who do the work are instead engaged in the tasks to be done and the processes to be undertaken.

### Point to Ponder

Everything in our society reflects a vertical orientation, including organizational hierarchies. Leaders now must complement vertical thinking, which is about control, with horizontal thinking, which is about relatedness. Both are necessary, yet leaders, because of the prevalence of vertical thinking, must at this time concentrate on building horizontal connections.

In most organizations, the organizational chart speaks volumes about the structuring of work and the value placed on it. Lines and boxes enumerate the various functional capacities expected within the context of each role. The reporting infrastructure is critical to the structuring of work, and clear lines and patterns of interaction are important—but only with regard to communication about work activities.

Workers at the point of service generally are not concerned with value, linkage, and integration. Instead, they are busy per-

forming the routines of daily work and perfecting these routines so that the work gets done effectively and within the allotted timeframe. As a result, they often view the work as more important than its purpose and become caught up in the politics and process of work, which impairs their ability to embrace change and adjust their activities in response to new demands.



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Exhibit 2-2 Institutions Versus Systems

**Institutions**

- Unilateral interests/goals
- Nonaligned
- Driven by self-interest
- Focus on structure/function
- Highly competitive
- Survival focused
- Vertically integrated

**Systems**

- Multifocal interests/goals/values
  - Strong alignment of stakeholders
  - Collateral interests
  - Focus on relatedness
  - Outcomes driven
  - Centered on thriving
  - Horizontal/vertical linkage
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In systems, on the other hand, the real work of management and leadership is to refocus work and place it into its appropriate context. To do this, however, leaders must avoid being equally co-opted by the work and thereby prevented from identifying its relationship to other factors that influence it. Imagine, for example, how challenging it is for leadership and staff to reconfigure the work they do and the service they deliver within the context of a value-driven framework for health care. Different from functional and process-based focuses, where the emphasis is on the quality of the work, value-based practices center on the intensity and integrity of the relationship between the work, its purpose, and the achievement of a sustainable health outcome.

Many of the problems in organizations arise from the inability of leaders to think and act horizontally or collaterally. In other words, leaders must be able to see the whole and characterize each of the units of work within the context of its contribution to the whole. They must also be able to see how the units work together to advance the purpose and value of the whole. The interface and the intersection of work in all the various locations in a system are as critical to the success of the system as is the quality of any individual effort in the system.

In essence, leaders, regardless of their location, see all work from the perspective of the whole system. Indeed, they analyze each work activity in terms of the function it plays in achieving the purpose of the whole. The leader's role is based on the system's imperatives and how the individual and collective work activities operate in concert to achieve them. At the same time, the structure of the system enables the leaders to see and act out of systemness and keep in touch with the demands of the whole. A part of constructing more effective organizations is the consideration that the compartmentalization and isolation of leader and staff action in departments, services, and units limit their ability to connect. More value must be attached to individual effort to seamlessly connect it to the purposes of the system. The reverse is also true: Infinitely challenging for executive leaders is the capacity of leadership to connect the strategic imperatives of the system in a meaningful way to the individual work activities unfolding in departments, services, and units.

Systems operate more as biological units than as mechanical structures. They are the sum of all the dynamics that drive them. Therefore, they are best viewed as a set of relationships and intersections rather than as a mere collection of components. In systems, the intersections between the elements are as critical as what goes on within

any single element. The goodness of fit between the actions and processes of a system is what ultimately creates the fluidity that is the system's essence. Goodness of fit is much more important than any element by itself. Effective leaders always examine the activities of the members to determine their goodness of fit with each other. One of the leader's challenges is to bridge the dichotomy between the workers' focus on good task and their need to focus on good fit.

Leaders and staff need to recognize that no one person can make a sustaining contribution though his or her own efforts alone. Although an individual's efforts can achieve incremental improvements, the sustainability of these improvements depends on the degree of interface between the individual's efforts and the consolidated and aggregated efforts of the whole. The ability of leaders to make this fact clear to the staff is critical to the effectiveness of their activities.

As noted previously, work is not inherently valuable. Instead, its value lies in its purpose, and the efforts of leaders should reflect this reality. Yet decades of process and functional orientation at every organizational level have made a belief in the value of work effort alone a fundamental part of every worker's belief set. Just observe the reaction of healthcare workers to the myriad work-related changes that, in their view, prevent them from effectively doing the activities with which they have become most familiar. In addition, many workers are mourning the fact that they are no longer performing the tasks they had come to know so well. What they have forgotten is that many of these tasks have been made obsolete by changes inside and outside the organization, and leaders now have the major challenge of reintroducing staff, as well as other leaders and managers, to the concept of system and then convincing them of the importance of fitting the organization's work to its changing purposes. This is especially true as leaders attempt to create the change context that translates the national imperative to move health care out of volume constructs into a much stronger value framework.

During the twentieth century, the various healthcare disciplines, out of a need to find meaning in their professional work, tried to define themselves and to devise and promulgate practice parameters. Indeed, one of that century's achievements is the contribution of the healthcare disciplines, from nursing and medicine to pharmacy and nutrition, to the improvement and elaboration of health services, leading to a broader and more complex array of services than has been available at any time in human history.

Today's challenge for the health professions is to make their boundaries more fluid and to renegotiate their roles to create a comprehensive continuum by better integrating the health services they provide. Value-based health care now demands that the professions find the interface between their roles and construct the collateral and collaborative network of relationships and interactions that best meet patients' needs and advance the quality and value of health service. The professions now must find what connects them rather than focusing on what separates them. In other words, here again the components (the professions) must converge to address the whole (the public's health). Further, technological tools now make it possible to do this—and make it necessary, at least if the health professions are to ensure the health of people over ever-increasing life spans.

## Group Discussion

Discuss the healthcare professions as they are currently configured and predict their likely future. Are they going to be able to function effectively in the twenty-first century as they now exist? If not, how will they have to be revised to remain relevant in the new age of health care?

## Principle 2: All Health Care Is Local

The integration and effectiveness of health services depend on local relationships, not centralized authorities.

Everyone has heard at least once that all health care is local. As Martin Buber would have said, all health services are provided within the context of the “I-Thou” relationship: In healthcare language, someone provides a service, someone receives it. Through this fundamental human equation, care and healing emerge, and everything from structure to equipment, competence to relationship, is reflected in it. When two or more parties interact, the result is always an intimate bond represented through the exchange of feelings, thoughts, expectations, conversation, and action (I-Thou). From a systems perspective, most of the other components of the system converge at some level to support this exchange, and those that do not ultimately will impede it.

The function of structure in a service system is twofold: (1) to ensure the integrity of the system and the ability of its components to work in concert to achieve its ends efficiently and effectively and (2) to facilitate the work of the system. In health care, the purpose of a health system is to address the needs of the community. The system, of course, cannot serve its community without also serving individual members of the community at the point of service; although at the governance level, the system serves the community as a whole. Both levels—the point-of-service level and the governance level—are essential, and each supports the other.

The main implication of this principle is that each element of the system must serve to empower those at the point of service and allow them to provide care to the community through their individual acts. In an effective system, 90% of the critical decisions are made at the point of service, and the life of the system is always primarily lived out there as well. At the point of service is the intersection between the purpose of the system (strategic) and the place where the meaning and the life of the system is expressed (point of service).

An effective system has no more structure than is absolutely needed for its work. When unnecessary structure exists, it tends to suck resources and work away from the point of service. The more structure a system has, the more likely the system will support its structure rather than its services, the more money the structure will

### Key Point

All health care is local. A system operates from its point of service outward. If a healthcare provider is not directly giving care to a patient, he or she is serving someone who is.

cost the system, the fewer the resources the system will have available, and the less able the system will be to thrive and fulfill its purpose.

In a system, everything operates from the center out. Systems are organic in shape and design. The most obvious configuration for a system is a circle. That this is so indicates that systems are more about relationships and intersections than about anything else. Systems possess flow and fluidity and are more dynamic than static. They encompass interactions and relationships in a continuous and vibrant interplay that results in the fulfillment of their purposes. All the activities of a system work together to help the system adapt to changes, meet its goals, and ensure its survival.

Every system takes its life from the places where it intersects with the greater community. In particular, a health services system is directed toward advancing the health of the community where it is located, and there is obviously a tight relationship between the system and the receivers of its services. The system must therefore make sure that its services reflect the community's culture. The leader's role is to ensure that the purposes of the system and the needs of the community are congruent and that everything the system does is directed toward meeting those needs in a culturally appropriate manner.

All other components of a system are intimately connected to its center—the place where it carries out its mission. At this place, the point of service, the provider and the receiver of services meet, the community is served one member at a time, the life of the system is expressed, and the value of the system is realized. All the system's other components should be configured to support the activity at its center.

The point of service is also where the majority of conflicts occur and where a poor structure has the largest impact. If the processes at the point of service are not structured with goodness of fit in mind, the system will begin to break down. Eventually, its purpose will become lost and its ability to thrive will be compromised.

The vast majority of the work done by the leader of a system involves building sustainable relationships, driving innovation, and keeping the system intact and on course. Because a system is a membership community, it can easily lose sight of its purpose and forget what its real work is. The leader seeks congruence between the system's purpose and the work of its members, and in doing this the leader faces the challenge of overcoming the ever present conflict between personal and collective agendas. The leader must keep aware that the system is a membership community and remind others of this fact as well. A good leader realizes that the system's survival depends on the dance between

### Point to Ponder

Culture rules. The point of service is driven by the culture of the patient population. The system is driven by the culture of its community, which gives it purpose, and the culture of its members or workers, who give it focus. These constituencies converge to drive the system to thrive.

good structure and good process, the members' focus on the product of their work, and the positive impact the system has on those it serves.

A good leader also ensures that the structure of the system does not impede the system's fluidity and flexibility—its ability to quickly adapt to changing conditions. To do this, the leader must revise the structure as the system grows to position the system to better serve the

community. The leader also must be sensitive to the tightness of fit between the system's structure and its purposes because the structure has the potential to obstruct the work processes rather than support them. When the structure does act as an obstacle and draws to itself unnecessary resources, it must be reconfigured.

The point-of-service workers must be able to act so as to meet the demands of the culture of those they serve. For example, they should have few constraints placed on their ability to make decisions and construct appropriate service arrangements and processes. Of course, their actions should be informed by principles and practices worked out in advance by the stakeholders at the point of service.

The configuration at the point of service must, at some level, reflect the character and content of the work. Here the issue of differentiation becomes critical. Each population-based service configuration is unique because it represents the characteristics of the specific population served. The twentieth-century addiction to sameness must be overcome. The rules that govern the functioning of each service must be derived from the service's relationship to those served, not its relationship to the prevailing structure of the system. Although structure is critical at other places in the system, it is not appropriate at the point of service because there the culture of the population is more important than the needs of any other element of the system.

The notion of the point of service is dramatically changing as the various elements of health reform are translated into action in an accountable care format. Value-based care along an episodic or population continuum demands much more fluid, portable, and variable approaches to both designing and delivering healthcare services. This notion of point of service includes a stronger orientation to user-driven, home-based, community-centered approaches to service delivery that moves providers out of an institutional frame of reference into a service-based frame of reference. This shift represents a stronger grounding in community- and population-specific models of care delivery. The service provider is much more mobile and adaptable at the point of service in a clinical model that addresses the cultural and structural issues of users more than the institutional structural formats of the provider (Hines & Mercury, 2013).

## Group Discussion

The point of service drives approximately 90% of the decision making in a healthy and effective system, and therefore most of the decisions should be made by the workers located there. For example, the Ritz-Carlton Hotel is well known for allowing its point-of-service workers to make service decisions to enhance guest experiences. Discuss the effects on a health system of moving 90% of the decisions made to the point of care. What impact would this have on the authority structure of the system? What changes would have to occur to make the transfer of decision-making power sustainable? How would staff have to change to manage the additional decision-making responsibilities?

The preceding makes clear the importance of the point of service and the need for structural independence and functional liberty at the point of service. Each point-of-service worker has an obligation to ensure that the decisions and activities that unfold there are congruent and that each is informed and disciplined by the system's purposes and direction as it addresses the needs of the community. Furthermore, the decisions made at the point of service should predominate because they give form to the work of serving the community one person at a time. Out of this dynamic—consisting of the interplay of the system's purposes with the worker's decisions and activities—come the seamless and symbiotic relationships between the system and the workers that create the place where the system lives out its purposes and makes a difference in the lives of those it serves.

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### Principle 3: Value Is Now the Centerpiece of Service Delivery

Anything that adds value to any part of a system adds value to the whole system. The sustainability of the system requires the aggregation of numerous additions of value.

In the Industrial Age, assessments of value were often based on volume. One of the most common measures of the value of work, for instance, was the quantity of work done. Even the language of health care reflected a volume orientation: Nurses, physicians, and other health professionals, as they said, wanted to do the “most” they could do for their patients. The processes associated with work were viewed as almost more important than the work's purpose, and there was a sense that the activity of providing health care was inherently valuable. The orientation toward process was almost sacrosanct, and much attention, even in the quality movement, was devoted to establishing good processes for delivering services.

Users of health service have the right to know about the services they are provided, including the quality and cost. Increasing emphasis on healthcare transparency requires that users of health care have the information necessary for good decision making and can choose health services and providers based on some objective, measurable notion of value. Providing reliable value including cost and quality information helps inform user choice. Users use this information to make particular choices in a way that is consistent with their values and their resources. Over time the use of user-modified cost and quality information informs more effective thinking and appropriate resource use.

Good value is driven by a notion of high-level interoperability. Interoperable systems (integrated or converged) are deeply embedded in the DNA of effective service systems. The integrity and integration of processes, functions, and structures necessary to support an effective service are essential. Cell phone technology is perhaps one of the best sources of evidence of interoperability: Many thousands of functions, components, and elements converge to create an instrument that can be used for multiple purposes, from grocery list making to gasoline purchases, information seeking to entertainment, access to education to services and products. Accessibility and high levels of integration and interoperability in the health system facilitate user choice, utility, effectiveness, and, ultimately, good experiences and positive health impact.

Although process integrity is vital, it does not itself create or add value. Work processes are always disciplined by and gain their meaning and value through the purposes toward



which they are directed. Any activity, to be meaningful, must at some level advance some purpose; otherwise, the worker is taking value away from the enterprise. Even if the worker does nothing, the action of doing nothing is actually drawing value away because purpose could have been positively advanced by almost any activity—an activity that is not being performed. Work, then, either adds value or reduces it. It adds value when it advances the purposes of the system, and it takes value away when it fails to advance these purposes.

In a true system, all activities, roles, and functions, no matter how large or small, have value. Each, when working in concert with the others, does something to advance the system's purpose and has an impact on the system's vigor and viability. For this reason careful selection of every role in the system is essential to the system's ability to thrive. This ability depends in part on the goodness of fit between roles and functions, not simply on the roles and functions themselves.

Value, however, is not just tied to the persons who do work. Value is more closely linked to the products of that work. Increasingly, there is a demand for transparency between process and product so that this fit is continually assessed and evaluated to determine the efficacy of the relationship between process and product. Users expect to have the right and the capacity to make value decisions based on data that reflect the effectiveness of health work through the lens of its impact on health. Increasingly, government entities, insurers, and advocates require that accountability-driven evidence-based data be constructed and made available to enable users to make wiser health service choices. This public representation of value allows users to make effective judgments related to health service comparability, costs, quality, and sustainable impact. Through this mechanism, both the form and action of value become drivers of choice based on measures of quality, cost, and impact (Hacker & Walker, 2013).

### Key Point

Everyone in a system is obligated to add value to the system. Everyone is doing something, even if it is negative. If someone is not adding value, he or she is taking away value.

The triadic relationship between purpose, person, and performance is the cornerstone of any measure of vitality in any kind of system. The effective leader understands this relationship almost intuitively. It is so embedded in the dynamics of the system that almost nothing can be accomplished if it is not used as a framework. The whole is a reflection of the fit between its parts—of the congruity and resonance of the many functions that make up its infrastructure. As these elements join in a seamless dance of intersection and interaction, each individual element becomes invisible, but all of them together, at least in a true system, work so harmoniously and are so tightly interwoven that they are perceivable only as a whole. In a noneffective system, the parts and pieces are easy to see because of their incongruence and lack of flow or fit and because they appear out of context. Rather than contribute to the whole, they draw resources, energy, and attention away from the whole, impairing its integrity. They can cause a system to break down and fail to achieve its purpose.

Contemporary thinking about evidence-based practice reflects this focus on essential systemness. Evidence of making a difference in the lives of those we serve cannot



be determined unilaterally. Isolating individual action from the intersection with other forces and actions simply does not tell us whether any sustainable difference has been made and whether our actions had anything to do with the difference or change. Only when integrated and synthesized, if you will—with other related and connected efforts—does the convergence of the effort produce anything meaningful. The convergence of efforts, related and linked together, drives evidence of contribution and sustainability of effort and outcomes. In current efforts to establish evidence-based clinical processes as a foundation for clinical decision making, success is limited to the extent that the system connections between stakeholders are made and the interface of collaborative efforts is established. Evidence of making a difference is also evidence of collaboration, integration, and systemization of all the related contributions.

Leaders must operate out of an understanding that each component of a system is a microcosm of the system. To lead any one component, a leader must direct his or her vision from the perspective of the whole toward the part, rather than the reverse. The focus should be on the whole system and on how each component contributes to the integrity and action of the whole. From this perspective, the leader diagnoses the element and evaluates its goodness of fit with the other elements as they contribute to the whole. The leader also attempts to keep value, which depends on the congruence of work, quality, and resources, at the center of everyone’s sense of relationship to his or her work and to the workplace (**Figure 2-2**).

The leader is always aware of the connection between the elements of the system and the fluidity and “tightness” of the intersections between elements, where the life of the system is most evident. Questions related to interface, connection, integration, communication, and interaction are the driving concerns of the leader. If there are problems in a system, even if they originate in inadequate or failed processes, they are ultimately expressed as brokenness between the elements and in their failure to exhibit the flow, seamlessness, and linkage essential to the system. For the system to advance, individual contributions must be woven together in a way that achieves substantive consonance.

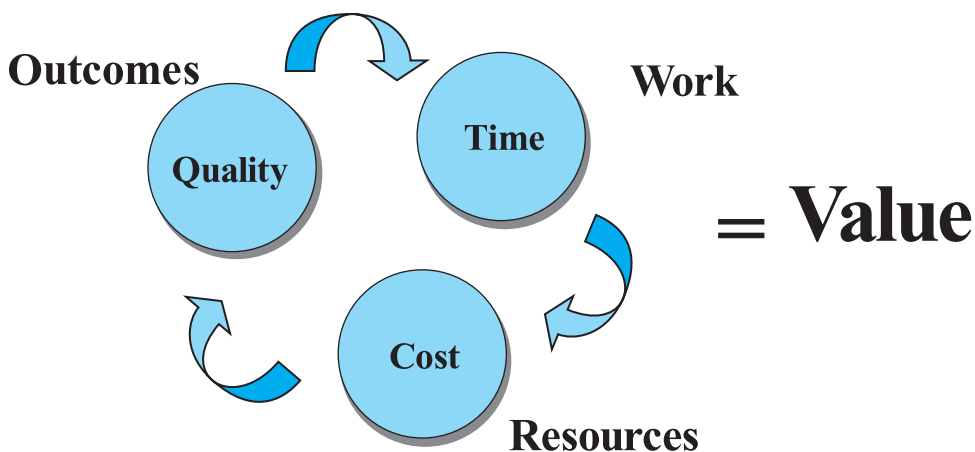


Figure 2-2 The Value Equation.

## Principle 4: Simple Systems Aggregate to Complex Systems

Simple systems combine with other simple systems to form more complex systems. Complexity grows incrementally through the interconnection of smaller, simpler systems (called chunking).

To understand complexity, we need to look for the simplicity that is generated from its center. Everything is related to everything else in some way. This concept lies at the center of any understanding of how systems operate and thrive. The task of a system's leader is to delineate the linkages and intersections among all elements of the system. The leader identifies the common elements present everywhere in the system and those unique contributing elements that are located at critical places in the system and contribute to the effectiveness of the whole.

Every element of a larger system is a system itself. It has its own simplicity, complexity, integrity, and chaos. If the component system is viewed only as something simple, its fit and contributing purpose remain invisible. They are disclosed when the system is seen in the appropriate context (i.e., as part of the larger system).

Each component system abides by the same rules as the larger system. The component system must have fluidity, fit, and integrity, and its parts must intersect and operate in a way that advances its contribution and value to the whole system. The component systems' substantial and continuous interaction—what Kevin Kelly calls clumping—maintains the integrity of the larger system (Kelly, 2010).

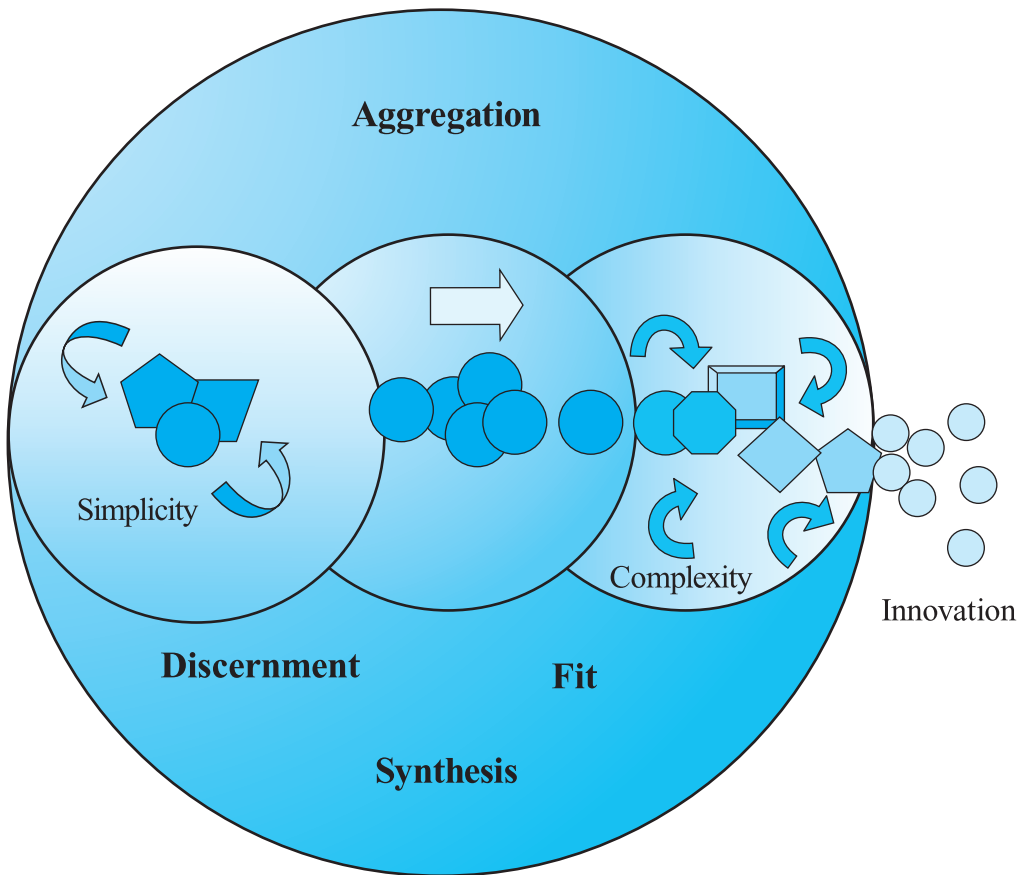
With regard to component systems, there are two basic requirements. First, each must have well-integrated components and function well internally. Second, the systems must

### Point to Ponder

A leader who is head of a particular service or department must see his or her role from the perspective of the whole system. In fact, the best way for leaders to look at matters is as if the leader is leading the whole system from the perspective of the particular service or department. Each leader's commitment to the system gives the leader, no matter where he or she is located, focus and a framework for the expression of his or her role.

### Group Discussion

Sam Casey, as head of his department, has consistently looked out for the interests of his department and its staff. Occasionally, he has had to fight other departments to get what he wanted for his own. According to him, that is all part of being a good leader. Discuss whether he is right. Among other things, consider Sam's approach from the perspective of systems thinking. What problems is his approach likely to create? What advice could Sam be given to help him improve his leadership? How should a departmental leader balance the system's needs and the functional needs of the department?



**Figure 2-3** From Simplicity to Complexity: Aggregation Across the System.

intersect and interact with other related systems to make up the larger system and ensure its effectiveness (**Figure 2-3**).

In the past, leaders have not always paid attention to these requirements. Many organizations have suffered from the narrow focus of leaders who concentrate on their area of responsibility to the detriment of other component systems and the enterprise as a whole. Even reward systems sometimes encourage people to excel at the expense of others, destroying relationships, obstructing interaction, and skewing the distribution of the available resources. Whole organizations are held hostage to these highly unilateral decision makers and never fully achieve their potential. The glue of trust is never established, precluding the level of productivity that can result from a truly resonating system.

Every leader of a component of a larger system must ensure that the component operates effectively. The effectiveness of a component system, however, cannot be achieved simply through having an internal locus of control. For example, in an organization that provides health services, although the point of service drives the content and culture of the entire organization, the point of service must also reflect the obligations and operations of the entire organization. Each smaller system should mirror the larger system,

although it is refined in its specific manner of representing it. Anyone who comes directly to the smaller system should see a picture of the whole system, including that system's mission, service, quality, and outcomes, all of which should be manifest in the smaller system's work.

Too often, healthcare organizations have components that do not fit together well. Think how typical it is for people seeking healthcare services to be asked the same questions over and over again as they move through the system. From admissions to treatment, a patient may face five or more points of query simply because the components do not interact seamlessly enough to eliminate the need for them. The cost of allowing simple systems not to operate smoothly together has never fully been measured. Complex systems work because they act interdependently, representing their synthesis at every point in the continuum. Without this synthesis, systems break down and ultimately fail, affecting everything within them and everything to which they are connected.

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## Principle 5: Diversity Is Essential to Life

Diversity is essential to life on every level. Only where diversity is present is the capacity to thrive ensured. Diversity makes chaos visible because it pushes systems to forever adapt to changes in their environment.

It is common wisdom—at least if you believe the literature on leadership—that conflict should be avoided and that processes must be in place to reduce conflict to a minimum. Unfortunately, nothing could be further from the truth.

Diversity is the visual manifestation of the chaos that exists within all systems. That chaos is the energy that arises from the confluence and conflict among the elements of a system as they intersect to create the conditions necessary for the system's adaptation. Diversity is a characteristic of the endless dance of design and configuration as the elements confront each other and sort out a way of fitting together.

In creating an effective and meaningful workplace, leaders must attend to a number of issues. First, they must understand that diversity is necessary for a system to thrive. Kelly (1995) uses *heterogeneity* to refer to the essential element in the movement and adaptation of any system. Whichever word is used, a wide range of views and roles is essential for determining the direction the system should move in and for establishing the common ground necessary for leading the participants and elements in that direction. Homogeneity is the enemy of success because it represents the unilateral, the stable, the inert. Missing from homogeneity is the contrast, conflict, and interfacing among elements and their sorting and reconfiguring around ever-changing circumstances as the system keeps rhythm with the environment within which it must thrive.

The presence of conflict indicates that a system is healthy and energetic. It enables the leader of the system to see the differences that exist and challenges the leader to sort through the differences to determine what they indicate. Embedded in these differences are the many varieties of influence that, when viewed together, tell the leader where the organization is, what the issues are, and what the organization's responses might be.

Leaders must recognize that their main work is interpreting present activities in light of their potential to create the future. The future does not simply happen. Each future

moment is part of a flow of activities whose completion lays the foundation for the next set of activities arising in the next moment. Each moment encompasses indicators of the next moment and of the changes that will occur then. To influence the future, therefore, the leader must be able to see the vortex of conflicting and converging elements to get a sense of the trajectory of these forces and what their convergence tells about the context and content of potential change.

The leader must be able to harness chaos through its visible conflicts and divergences because these reveal the direction of any changes that are occurring. For this reason leadership roles in today's world are more that of gatherers than directors. In the old Newtonian model, the leader of an organization was expected to determine the organization's strategic endpoint and direct the organization toward it through personal influence. Today the leader's strategy should be to connect with the diverse components of the organization to engage the collective synergy that yields insight about the appropriate and right choices for the system's trajectory. In doing this, the leader should capitalize on the strengths, skills, insights, and wisdom that are located in these diverse participants. Only by embracing and engaging the diversities and conflicts within the organization is the leader able to discover the actions most likely to keep the organization thriving.

### Group Discussion

Charles Frederick has been the chief operating officer of a health clinic for 2 years. He is nice enough but hates to have his views or leadership questioned. Therefore, although he hires bright people like himself, he tends to favor people who think like him so that he will not have to fight to achieve his goals. In time, his staff have come to understand this and have stopped offering different insights and points of view. Discuss what happens when leaders hear only what agrees with their own thinking. What is missing from the decision making in such a situation? What are some of the problems that arise? Among other issues, what are the effects on accountability?

Here both the value and the meaning of conflict become especially important. Conflict is a vehicle for discerning the proper direction for the organization to take. In particular, it is the strongest indicator of where to begin the work of determining the most appropriate actions at any given time. The leader both honors the essential differences that exist and uses them to reach clarification. These differences include cultural differences as well as the diversity of insights, opinions, and skills possessed by members of the organization. No one person has all the knowledge and abilities necessary to adequately "see" the patterns of emergence embedded in diversity, complexity, and chaos. Only through processes that actualize the disparate potentials present in the full range of participant contributions can the signs of change and its themes be found. A good leader can tap into this diversity by using effective methodologies. Through dialogue, for example, the leader pulls out the premises, themes, and signposts that indicate the best direction for

the organization to move in and the actions most likely to lead it in that direction. The goal for the leader, in short, is to utilize collective wisdom and, through the coalescence of this effort, establish the foundations for organizational common ground.

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## Principle 6: Error Is Essential to Success

Both random error and conscious error are essential to the process of creation. In fact, error underpins all change.

Historically, leaders have been taught that error, especially in health care, is harmful and must be avoided at all costs. And of course, in the clinical sense, for the most part that is true. However, what we have now come to understand is that error is an essential constituent of all change. Further, error can be used as a measuring device to indicate where people are currently located on the pathway to some desired impact, endpoint, or outcome. Therefore, leaders must value error as a useful leadership tool.

Error is present everywhere in the universe. It is embedded within systems and contributes to their adaptation and thriving. Error indicates where a system has to adjust to new circumstances. It forces people to stop a process of change long enough to assess the situation and make the necessary modifications before resuming the process.

It informs the agents of change of where they are in the change process and what is actually happening (Erwin, 2009). It alerts them to a change in conditions or a breach in the process or a demand for a different response. Error indicates where and how the system is in relationship to a process or an initiative. It alerts people to the convergence of incongruent variables that led to the mistake or flaw and that indicate their presence or impact on the flow of events.

### Key Point

Error is essential to all progress. Far from being a deficit, error indicates where someone is on the journey. The only unacceptable error is the error that is repeated.

Error is an essential teacher. At varying levels of complexity, error indicates a break in the confluence and congruity of processes in a way that causes participants to note the break, assess the situation, and take action. Although some errors are certainly undesirable, such as those resulting in death or severe damage, even they serve as indicators of critical problems and as incitements to action. They teach, inform, advise, warn, and alert by showing that the current circumstances vary dangerously from the norm or from expectations. They point dramatically to important lessons and ensure that these lessons are, in fact, learned.

Error plays a critical role in learning and in developmental activities. When error fails to teach the negative energy embedded deep within it begins to emerge, operate, and create problems. The only inappropriate error is the error repeated. An error's repetition indicates that the relevant lesson remained unlearned (**Exhibit 2-3**).

Leaders can use error, as a constituent of change, to evaluate a change process and determine the best activities for advancing the system and preventing the same mistakes or flaws from recurring. A leader's attitude toward error determines how he or she addresses individual errors. If leaders value errors as tools, they tend to use each individual error as

## Exhibit 2-3 Mistakes Versus Errors

**Mistakes**

- Are nonrandom
- Are repeated
- Do not result in learning
- Impair sustainability

**Errors**

- Are random
- Are repeatable
- Contain lessons
- Foster sustainability

a guide to improving performance. If leaders treat errors solely as a cause for punishment, individual errors will never be able to serve as indicators of problems and as stimulators of corrective action, to the organization's detriment.

Of course, some errors must be controlled. Life-threatening or risk-intensive errors must be managed in a way that reduces their incidence and impact, even though these also have the capacity to teach. They cannot, however, be eliminated entirely. Concerted efforts to eliminate all error and strive for 100% error-free processes and environments defy reality. Error is the universe's mechanism for ensuring change, adaptation, and

advancement. Error is always present at some level. The total absence of error serves as a metaphor for death. How error is managed and used, where it occurs, how risk is strategically handled, and how improvement results are the keystones for effective error management processes.

Leaders must remember that there is a certain randomness to error and that all the good planning and control in the world cannot eliminate every mis-

**Point to Ponder**

Risk can never be fully eliminated. Indeed, risk should be viewed as a resource that simply requires good management. It is inherent in all human activity and must be accommodated in any plan. Planning for error makes room for risk and provides the space to learn from it.

take and defect. Errors can be reduced by a high degree of management and control, as demonstrated in the redundancy approach: Redundancy, standard processes, protocols, routines, algorithms, and so forth compensate for inherent error by making multiple and organized options available to anticipate and respond to the errors that do occur. For example, the airline industry (and increasingly health care) is built on good error management, which accounts for the fact that the level of risk from errors in flight is lower than the risk present in almost any other business activity.

Healthcare organizations also have a large capacity for reducing risk from errors. Because of the focus on value as an outflow of health reform, more attention is being paid to risk and error systems in these organizations. Indeed, many errors and risks are still not discussed and may even be ignored or overlooked because of the legal implications of exposing clinical errors with their attendant risks. In recent years, however, the unacceptable level of risk resulting from medication and medical procedure errors has brought about a renewed emphasis on risk reduction and error management activities. Increasingly, healthcare leaders use error as a tool in managing behavior and as a vehicle for change, rather than as a cause for disciplinary action. Consequently, they and other leaders would do well to become familiar with the new science developing around the



management of human error. As comparative effectiveness becomes a more important part of measuring and evaluating essential clinical value, increasingly sophisticated digital processes and tools become a common part of clinical leadership decision making.

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## Principle 7: Systems Thrive When All of Their Functions Intersect and Interact

Systems thrive when their functions and dynamics intersect and interact in a continual dance of relationship and transformation.

Newton once described the universe as a great machine. Einstein said it was more like one great thought; his point is that nothing in the universe is mechanical or organized in a machine-like structure. Modern notions of thinking and behavior are based on the emerging scientific principles and observations of our time and guide the management principles of the twenty-first century. An outdated Newtonian management perspective is that the purpose of workers is to accomplish the economic and production goals of the organization, generally through monetary, coercive, and control mechanisms.

More recent discussions of leadership in organizations represent later Western philosophical thought (generally that of Kant) and indicate the belief in the paradox of being subject to nature but also free from it. This move away from scientific rationalism deepens the understanding that people are both subject to the laws of nature yet free to set their own direction and goals. The product of disbelief generates a deeper understanding of self-organizing systems (instead of the notion of systems driven by an external, objective force living outside of the force's impact and therefore not influenced by it) demonstrating a growing knowledge of the action, interaction, and interdependencies of "wholes" generally understood in the concepts of formative teleology. The notion that humans are a part of nature as well as observers of nature makes them full participants in a way that cannot separate them from what they observe and participate in. Human beings essentially are free to act but are inextricably entwined with the nature of which they are a part, subject and mover at the same time (thus, human's actions have consequence and interact with other actions that also generate consequences). The contemporary struggle in this formative teleology is that the "agent" of change must use objective notions and ideas in a way that incorporates them inside of the "experience" of any change. The leader then allows this dynamic interplay to unfold in innovative and creative ways that generate new ideas, processes, and products that push the human experience continuously forward. In this scenario the effective leader is more facilitating a dance of interaction than directing a series of processes or functions.

Systems science posits that the universe operates as a set of interacting forces and interdependent relationships. Everything in the universe is in some way acting on or interacting with something else. Because interdependence is an essential characteristic of systems, the leadership role in a system is critically different from the leadership role in institutional models of organization. An essential ebb and flow enables complex interactions that flow out of a constant energy that represents an essential disequilibrium out of which streams novelty, innovation, creativity, and highly dynamic relationships and

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**Exhibit 2-4 Linear Versus Collateral Thinking**
**Linear Thinking (Industrial Age)**

- Vertically oriented
- Hierarchical
- Mechanistic
- Reductionistic
- Compartmental
- Controlling

**Collateral Thinking (Information Age)**

- Multidirectional
  - Horizontal
  - Whole oriented
  - Integrative
  - Intuitive
  - Relational
- 

interactions. This text rests on a foundation represented by this complex, emergent, and multifocal role of leadership, which reframes a conception of leadership that can be both formal and emergent.

More traditional theories of leadership—those that informed the work of leaders and organizations in the twentieth century—reflected both linear and vertical thinking (**Exhibit 2-4**). This mechanistic and highly structured approach to leadership favored the use of compartmental, formal, structured, and definitive work formats and processes to organize and codify work and its products. Workers were considered subsets of the work and were organized and treated accordingly. Much of what defined work was both developed and owned by the organization and those who directed it.

In the latter part of the twentieth century and the beginning of the twenty-first century, the very foundations of work and the workplace began to change as a result of the

### Point to Ponder

Advances in technology have made work more portable. Knowledge workers, because of their high-level skills, have gained substantial control of the work they do and have also become more mobile. Unlike the previous generation of workers, they are not faithful to the workplace. Instead, they are faithful to the work, moving anywhere the opportunity to do it appears.

emerging scholarship around complex adaptive systems and the subsequent complex responsive processes. Newer models evolved because of the advent of computers, chips, and information technology and their impact on every aspect of society. Knowledge work became increasingly important to the workplace, and organizations now require substantial knowledge capacity, most of which they could not own separate from the human beings who create it. The emergence of the knowledge worker changed the relationship between the worker and the

work, and also between the worker and the workplace. In today's world, workers typically acquire the skills and knowledge needed for a certain type of work in an academic setting rather than in the workplace. In complex thinking these workers are essentially "freed" from the organization by virtue of their own knowledge creation, generation, and utilization capacity, which operates independently of the structural constraints of the organization. In fact, knowledge workers and their capacity have become an economic value center, and systems and organizations compete to access these resources that they feel they traditionally or historically "owned." This has turned the understanding of work

and value on its head and changed the fundamental complex of relationships, interactions, intersections, and values in the social and economic enterprise.

Because of the accelerating digitalization of work and relationships, workers also have become much more mobile and portable because their skill sets have much broader utility than they did previously. Knowledge has become a resource in extreme demand, to the point where it is in essence a scarce resource, and consequently workers now are more important to the workplace than the workplace is to the workers. Because knowledge has great utility, portability, and transferability, workers have many more employment and value options.

While the worker has been changing, so has the workplace. In local enterprises as well as global entities, the organization and design of work have been radically altered. Organizations at all levels have had to create tight, efficient, nimble, and quickly adjusting work units (just-in-time models) to thrive in the more fluid, horizontal world of digital and wireless communication, fiber optics, nano structures, and other highly sophisticated technologies.

In this new world of intersections, interactions, interdependencies, and horizontal linkages, the entire infrastructure of work has been altered, as has our understanding of the mechanics necessary to facilitate effective work. The movement from institutions to systems has created a foundation for a new characterization of work and the worker.

Systems encompass closed and open components. Closed components are predictable, efficient, and ordered. They are the parts of a system that are constant and remain unaffected, at least directly, by external influences. The open components are adaptable and change in response to the constantly shifting demands of a dynamic environment. All functions and relationships in a system interact with and are dependent on the intersecting actions and processes in the system. Components such as production, service, management, governance, support, and locus of control are all included, according to common understanding, in the set of system functions. Of course, the relationship between the elements of process and outcome, as well as the relationships between structural and process components, is complex and as changing as technology and environment demand. In a complex system, no one element remains inert as other elements adapt to internal and external forces or lead the process of adapting to these forces.

This constant wave or flow of change and adaptation operates as the undercurrent of every system. The action never stops. The leader of a system, always aware of this movement and the constant exchange of energy among all the components, looks for the drivers and receivers of action and change (agents). The leader's attention must be on the ebb and flow of the cycles and the vortex of change as the system interacts with external sociopolitical, economic, and technological forces. The object is to discern the effects of these forces and to judge which actions will maintain the system's integrity, adaptability, and viability.

The leader of the system, of course, cannot perform these tasks unilaterally. All the leaders of system components must be made aware of the processes and skills necessary to manage systemness and of the interacting elements that make systems thrive. Any system is negatively affected if a single leader acts in the best interests of his or her component and without consideration for the impact of his or her behavior on the integrity of the whole. Such a leader actually holds the system "hostage" to his or her own component.

Component-centered behavior is common in traditional organizations. Various units, services, or departments of an organization might operate over long periods of time either independently or at the expense of other parts of the organization, especially if great sums of money can be produced as a result of their unilateral behavior. However, component-centered behavior is not sustainable. The dynamics of shifting information, service, and technology interacting with constantly changing demands of the environment creates the conditions that change strategy, trajectory, technology, resources, and the nature of work. Ultimately, the day always arrives when the organization has to pay substantially for its unconnected behavior, and the organization's ability to thrive will likely be threatened.

Every leader of a system component must recognize that his or her proper role is not simply to make the component thrive but to help make the whole system thrive. The leader's main attention of course is on his or her functional obligations to the component, but ensuring the fluidity, interface, connectedness, and flow of the component with the full range of system interactions (goodness of fit) is that leader's real work.

Over the years many theoretical approaches have emerged to try to define the structure and processes associated with an organization's work. From bureaucratic theory, the human relations school, the contingency and resource-dependent approaches to the strategic, population, and institutional models, theorists have written extensively on how and why organizations function as they do. According to the complexity approach, any element may act at any given time in an organization, and the interaction of forces will tell the leader how the organization is behaving and what the implications of its behavior are for its work and its transformative journey. Every system must possess structure and cultural foundations and must be able to respond flexibly to the environment and relationships, create value, improve itself, and interface directly with the external processes that influence its future. In other words, each theoretical approach contributes at some level to our understanding of how systems operate and how to make them effective (Northouse, 2012).

Biological metaphors frequently have been used to characterize the activities of systems, and each metaphor can assist leaders to focus on the functions and relationships that must work in concert. Signs point to an increase in complexity as a fundamental part of the evolutionary process. This complexity is an intrinsic force of evolution toward more complex organisms. In addition, general complexity is advanced by the astronomically large number of simple organisms that, although they are simple, establish complex interactions and relationships with each other in the larger environment. These simple organisms must work inside a complex network of interactions and partnerships in a way that facilitates balancing the whole environment, which is their medium for thriving. These multilevel, multilateral, simple organisms, when aggregated, create an integrated and collaborative collective that must maintain a tenuous balance and whole systems integrity to support the general thriving of each species and all species.

The analogy of a hologram is helpful in understanding organic complexity. In each part of a hologram, regardless of how many times it might be divided, the whole is always present. In short, the whole is always present in each of its parts. In this analogy, a whole system is reflected in each of its parts, and the relationship between the whole and each part is critical to both thriving. The role of the leader, in this perspective, is to

keep focused on both the whole and the parts of the hologram—the constant interchange between the parts and the whole and the impact of the parts on each other and on the operation and integrity of the whole.

### Group Discussion

The Industrial Age saw the emergence of a whole host of schools of leadership thought. Discuss the various approaches to leadership advocated by these schools (e.g., bureaucratic, human relations, behavioral, contingency, and situational). Then, reflect on the type of workplace that is emerging and discuss the implications for leadership style. As a help, consider which approaches to leadership might be appropriate or sustainable in the new age of work.

The leader must pay special attention to the points of interaction among the various components because therein lies most of the action, energy, and noise of a complex system, as well as most of the relationship, goodness-of-fit, and workflow problems. Because of the intensity of the dynamics there, sometimes problems and issues are not resolved or are “turfed” outside the locus of accountability that exists at these connective points. Examples include physicians taking their problems to the “administration,” managers letting relationship problems “hang,” and staff members refusing to deal with other staff members because the interactions would be too painful. Indeed, in any human system most activities, perhaps as much as 90%, reside at the point of service (the dynamic intersection) and the boundaries between the various services. Because these locations are where the applied work of a clinical system gets done, most of the issues affecting the work arise here. The problems are exacerbated if they are not resolved where they arise.

As principle 7 states, a system thrives to the extent of its intersections and interactions of its functions and actions. The best metaphor here is that of a continual, dynamic dance of interaction. The leader’s role is to act as choreographer and ensure that the parties and the parts resonate with each other in a seamless contributory partnership to sustain the energy of the system.

#### Key Point

The primary job of a leader is to manage relationships and interactions, mostly at the intersections of the system. Seeing the organization holographically (i.e., in three dimensions) can help the leader detect the interactions and processes that occur there.

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## Principle 8: Equilibrium and Disequilibrium Are in Constant Tension

There is a constant and permanent tension between equilibrium (stabilizers) and disequilibrium (challenges). This tension is essential to life and reflects the fact that disequilibrium is the universe’s natural state. For the leader, it is important to continually

investigate and to understand how the relationships among parts of a system generate the collective behaviors of the entire system and how that whole system interacts and relates with the environment of which it is a part.

Although it is normal for the universe to live on the edge of its own chaos, a certain amount of stability is necessary for change and for undertaking action. The role of the leader in this delicate equation is to find the points of stability and use them as places where evaluation and action can occur. The notion of variation is central to the balance between stability and instability. Agents of change (e.g., individuals, families, businesses, communities, countries, and computer programs) interact continuously with the variables and elements affecting events and direction of movement. Through use of their skills, knowledge, mental and physical properties, and location, leaders, among other agents of change, can take the best path to achieving improvements.

Leaders understand the dynamic interaction between stability and change and walk the narrow way between them with consciousness and purpose. The leader is constantly opposing the normative forces of entropy and dissipation even as those forces manifest in organizations and people, to ensure that the human system remains dynamic, active, and changing positively. They understand that absolute and continuous stability is synonymous with death. Recognizing this, they know the value of chaos and the necessity of harnessing it to improve the circumstances and processes of work and productivity.

### Key Point

In systems language, *stability* is another word for death. Absolute stability is the absence of life. The leader always walks a tightrope between stability and chaos, tending to favor the latter.

People do not make change. Instead, like disequilibrium, change is universal. This fact is at odds with the usual desire of people for stability and quiet in their personal lives. Leaders understand both the prevalent human wish for stability and the universe's tendency toward the creative and the chaotic. They know that they must develop strategies for addressing the conflict between equilibrium and disequilibrium—strategies that take into account both the environment and their own goals. Further, they know that not all strategies work as planned, and they periodically evaluate every strategy in use to make sure it is having the desired effect and revise it as necessary.

Time and shifting circumstances, often in part created by earlier strategies, have an impact on the chance of success of current strategies and on the formation of future strategies. A strategy that has stood the test of time can suddenly become unavailing. Changes in people and conditions can converge or act independently to influence what will work and what will not. Leaders must understand that wide variation in the effectiveness of a strategy over time is normal, and they must keep this fact in mind as they attempt to lead change and help people adjust to the inevitable adaptations that are a constant part of life.

The fluctuating effectiveness of strategies is one reason that measures of success are so critical to making judgments about what works. By using structured approaches to evaluating success, leaders can better determine what is working, what is not, what is shifting, what is emerging, and what adaptations need to be implemented. Measures do not have



## Group Discussion

Margie Smith likes to have all of her ducks in a row. She believes that good order indicates good leadership. Her office is clean and orderly, and her life is highly structured. Margie hates when people clutter up their lives and are unable to think logically or act rationally. She works hard to make sure that her staff know what she expects and do everything as she thinks it should be done. Recently, though, the pace of change has picked up, and new programs and technologies are being implemented faster than Margie can handle. She has become less orderly, less comfortable, and, at times, short with staff. She occasionally speaks negatively about some of the changes, she has asked her supervisor whether the rate of change could be decreased, and she has even begun to think about looking for another job, one that would give her more control. Discuss what Margie needs to do to cope better. What changes should she make in her role as leader? What is the chaos she is experiencing trying to tell her? Is changing jobs going to be an effective solution to her current discomfort?

to be perfectly accurate; they simply have to say something about where changes are occurring and what adjustments are indicated. In a complex system, an apparently “wrong” outcome is as significant as a “right” measure might be. In other words, in the chaos of change, it is as important to know the wrongs as it is to know the rights.

Changes in people or populations may create a need for changes in process and approach. A change may alter people’s circumstances, even their behavior, resulting in a need to alter the strategy or approach for the next stage of change. For example, people are affected by using the Internet, and thus those who use the Internet will likely require a process and mechanism of change that accommodates their new “position” as Internet users. For example, in pre-Internet times, “presence” meant that you were geographically located in relationship to another; in the digital experience of the Internet, “presence” has no geographical requirement. This digital notion of presence is now changing how we make and keep relationships, connect personally and emotionally, learn, communicate, and manage knowledge. If any approach to change does not accommodate or use these emerging digital realities, the adaptations implemented will have limited success. In general, the changes people undergo must inform the strategy used by leaders to guide further evolution. Here it is important to emphasize the concept of relevance and change. The relevance of a change is directly related to its timeliness and appropriateness within the context of the environment (for example, the digital universe) at any given point in time. There is nothing worse for an organization than to retain a strategy that lacks currency or to suggest a strategy that lacks timeliness and relevance.

Leaders look to people as both designers of change and vehicles of change. Although leaders are interested in changing people, they must be aware that people are a source of their own change because they are sources of learning and adaptation for each other, they act as initiators and/or recipients of change or improvement, and they are part of an



environment that is itself always in transition (Chrispeels, 2004). A good leader is aware that the people with whom she or he works are virtual experts on their insights, position, and condition relative to a desired or needed adaptation. By looking at the population, the leader determines where it is in relation to any given change and uses these observations as a template for evaluating measures and indicators of the external forces of change. The general behavior of a population always influences its specific behavior, just as any specific behavior might inform the leader about the best methods for altering the population's general behavior. For example, if a population uses a specific tool, such as a handheld digital device, for managing personal information and communication, it will more easily adapt to using such a device for communication, documentation, and interaction in the clinical setting. People's individual behaviors serve as both signposts and templates for broader and further adaptation in other settings and circumstances. Thus, as noted, leaders must be good signpost readers and translators and must use their interpretive skills to facilitate further change and adaptation.

Leaders must also understand that complexity and chaos represent inherent energy. Although leaders do not generate the energy, they harness it in support of a particular form and direction. This energy is always swirling in human circumstances—it never stops. Leaders discipline the energy, driving it in a direction that results in desirable or congruent changes. The interaction between energy and effort is what gives the changes their form, and it is the substance that can be defined and measured.

A leader must be able to discern the interaction patterns in the energy and flow of a change because these patterns are most indicative of the context and content of the change. The interaction among forces, agents, and environment is the substance of the change and informs the leader about appropriate responses. The leader looks for the convergence of these forces and elements. The “story” that they contain, when well read, tells the leader what responses are likely to lead to specific outcomes or products. From this set of responses, the leader selects those that are likely to move the system in the direction that is needed or desired.

Not all selections will be correct. The leader will choose an ineffective response as often as an effective one. Here again, it is not the selection that is critical to the change process but what the effect of the selection tells the leader and what the leader's response is. When a strategy is correct and does result in a preferred behavior or condition, adaptation is said to have occurred, and this adaptation forms the foundation for the next change. For example, particle beam CT scanners were highly successful as diagnostic tools, yet they also formed a foundation for future improvements and refinements. Electron-beam whole-body CT scanners currently provide more detail and accuracy and have broader

diagnostic and clinical utility, but these scanners could not have been developed until the earlier scanners had been devised and used. Adaptations often build on previous adaptations. In fact, all adaptations are temporary and merely serve as the foundation for future adaptations.

Leaders are constantly aware of the intense interactions of complexity. These interactions are

### Key Point

The leader lives in the space between action and potential, anticipating the next step and translating the process for others.

often represented in a chaotic vortex of energy that on the surface looks undecipherable. Yet when critically “read” and put into context, the vortex often reveals the “stuff” that will ultimately influence the next stage of change. Leaders are always pushing up against this potential energy, and good leaders are those who can translate it (context, systems, processes, and structure) into concerted actions. When an action joins with other related actions, the entire set creates the foundation for meaningful change. This can be viewed as a process of harnessing complexity. Through understanding and using complex interactions and intersections, through recognizing that all this is clothed in complexity and chaos, good leaders act to create the future.

## Principle 9: Change Is Generated from the Center Outward

Effective change generally moves from the center of a system to all other parts, influencing everything in the system. Successful and sustainable change is rarely ever driven from the top of any system.

Every system has a unique life that defines its meaning and value and gives it an individual character. Within the system are all the activities that create balance among the work of the system, the internal demands, and the external requisites for thriving. Because every system is part of a larger system, there is an ever-evolving dance or interchange among the activities inside the system and between the system and the larger environment of which it is a part (Figure 2-4).

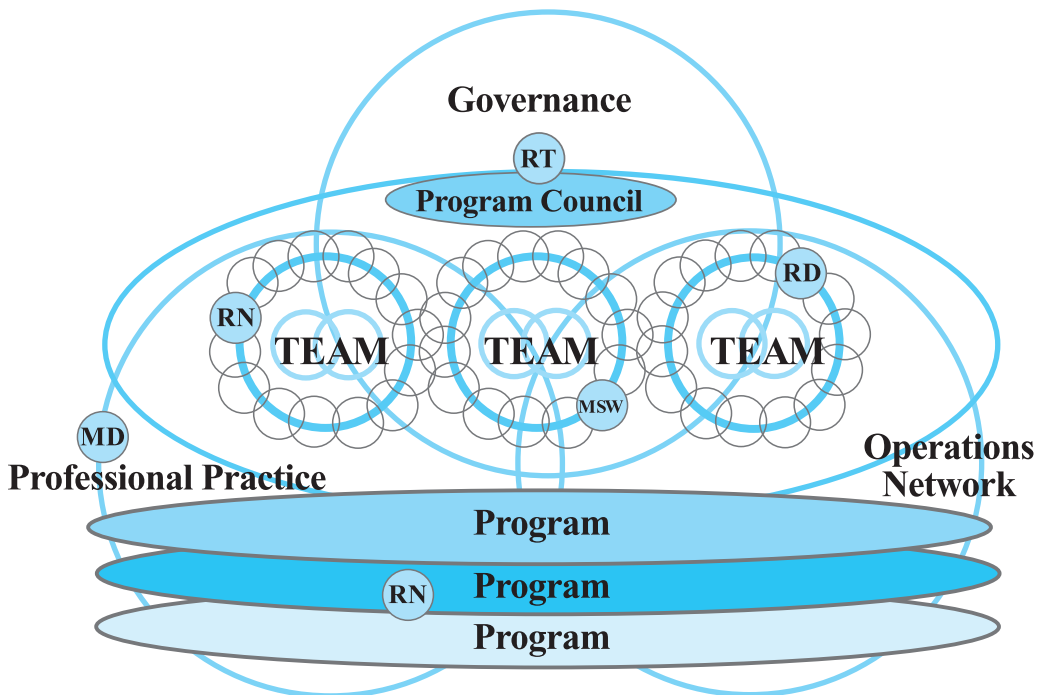


Figure 2-4 Out of Simplicity: A View of Complex Health Systems.

### Key Point

A system thrives only when those at the point of service own the decisions that are made there.

The “center” (i.e., the point of service) is where the system lives the majority of its life, and the workers at the point of service are especially critical to its ability to adapt and thrive. However, many components of a system contribute to its integrity and allow it to function and adapt, and many types of personnel, from managers to staff, play a role in advancing the work of the system.

In a service system, the value of the system is determined by the character and content of the services offered. The services have value when they are provided in a manner that satisfies those who use them. In addition, the services contribute to the system’s ability to thrive by demonstrating that the system provides valuable, high-quality services. Even more than the activities of marketing and business planning, the delivery of services creates the system’s reputation; thus, the people who deliver the services are critical to the ability of the system to thrive. They are, in fact, much more critical to the system than any other single role or factor, although this statement should not be taken as denigrating the value of any of the intersecting roles that make up the system.

No service system can be sustained if the point of service does not deliver. Although this truth is easy to state, in many, if not most, service organizations, the power, independence, flexibility, and locus of control necessary to respond immediately and appropriately have been designed out of the system’s point of service. These organizations have a vertical array of controls, hierarchical structures, and processes that obstructs decision making where the pertinent issues most often arise—at the point of service. The ascending ladder of control moves the authority for decision making away from the point of service, and the farther away the locus of authority is, the less likely the decision will meet the need that motivated it. In a typical example, a physician on a unit who has a problem with a staff member might take the issue to the administrator to make sure that the highest level of authority is brought into play. But if the problem is to be solved permanently, the solution must involve those who are located where the problem originated, and so action on the solution must ultimately be returned to the point of service.

Systems develop dynamic and cyclic patterns. In a typical pattern, there is a core or center point where the pattern either originates or culminates. The mosaic of activities ultimately builds on or supports the center point (**Exhibit 2-5**). In a service system like a healthcare organization, all structure that is sustainable builds on the service configuration, and the system’s sustainability depends on the degree of congruence between the prevailing service structure and the supporting structures. If the system is well designed, most of the organizational configurations advance the freedom of activity and judgment at the center point (i.e., point of service). If they do not, they increase the chance that the supporting systems become the center point and therefore draw energy away from the proper locus of control, creating a framework that demands attention and resources that should be focused on the point of service.

The more the focus of a service system is drawn away from the point of service, the more expensive the structure of service becomes. Articulating Taguchi’s rule: the farther away from the point of service a decision about what happens there is made, the higher

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Exhibit 2-5 Mosaic of Decision Making in a System

**Point-of-Service Decisions**

- Individual
- Service driven
- Judgment based
- Highly variable

**Team-Based Decisions**

- Team defined
- Group standard
- Protocol driven
- Agreement based

**Unit or Service Decisions**

- Coordinated
- Support based
- Standards driven
- Resource related

**System Decisions**

- Integrated
  - Collective
  - Direction setting
  - Resource generating
  - Support systems based
- 

the cost, the greater the risk, and the lower the sustainability of the outcome. In a system in which those responsible for structuring the system are not dedicated to enabling the locus of control to remain at the point of service, the tendency is for more and more decisions to move away from the point of service and for more infrastructure to be built to compensate for the lack of control there. In addition, the more infrastructure that is built, the more extensive (widely dispersed) the lack of control becomes. The cycle of compensation continues until there is so much infrastructure that the cost of supporting it exceeds the cost of providing services (Mori & American Society of Mechanical Engineers, 2011).

The leader of a service system labors to fully comprehend the essential interactions among the system elements and assess the degree to which those interactions facilitate the work going on at the center point. The leader also must assess the degree to which the system's configuration supports the openness and ownership of decisions and actions at the point of service and the amount of compensation necessitated by inappropriately made decisions. The leader judges the level of skills at the point of service and looks at the support structures necessary to ensure that the level of competence there is right and in the right configuration to meet the needs of those served. It is not just what the leader knows about the people, the services, or the system that matters, it is also what the point-of-service workers know.

The effectiveness of the system is directly related to the system's support of decision ownership and application at the point of service. In addition,

**Key Point**

When any system has too much structure, the energy of the system begins to support the structure rather than accomplish its objectives. Unnecessary structure draws resources away from the system's services and interferes with its ability to do its work. The same holds true for unnecessary management.

**Point to Ponder**

The only difference between revolution and evolution is the time and pain it takes to make a sustainable change.

when structure at the point of service supports decision making and action there, less infrastructure must exist at other levels of the system. Financial and professional costs accelerate when the locus of control shifts to other places in the system. To avoid fostering illegitimate loci of control leaders must ensure that most decisions and actions remain at the point of service. A shift in the locus of control away from the point of service causes a misfit between decisions and the specific situational needs of the services and their providers. It also obstructs the provision of competent, skilled, high-quality services and the workers' sense of ownership of their work.

Leaders are fully involved in setting up and assessing the adequacy of the support structures of the overall system. These structures must be configured in a way that does not take from the point of service what belongs there. So also must the functions of strategic, operational, and service support be configured in a way that allows them to be understood and implemented there. The goodness of fit between the contextual activities of the strategic and support systems is vital because all the processes that unfold in the structure of the overall system must ultimately contribute to the provision of services. The leader's understanding of the impact of structure is critical to informing the database of the point-of-service workers that guides their decisions and actions. Leaders act as moderators of the relationship between those in the strategic and support systems and those at the point of service.

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## Principle 10: Revolution Results from the Aggregation of Local Changes

Revolution (hyperevolution) occurs when many local changes are aggregated to inexorably alter the prevailing reality, called the paradigmatic moment.

Most changes that occur are progressively evolutionary; that is, they happen in a continuous and dynamic process over a period of time—most often over a very long period of time. Included are many iterations of evolutionary dynamics within which change can occur (co-evolution, punctuated equilibrium, mutation, adaptation, speciation, etc.), yet all of them lead to a change of some kind. As Darwin pointed out, the evolution of species is a dynamic process in which the living creatures best able to adapt to the changing environmental circumstances survive and thrive. This is no less true in the human enterprise.

A revolution, on the other hand, is a dramatic, almost instantaneous, change in conditions, and it presents living creatures with the challenge of adjusting quickly. In a revolution, many events converge to create a situation in which life can no longer be lived in the same way.

A revolution usually occurs in a system when the components converge to make enough of a demand for significant change. This demand is usually a result of the components being acted upon by the external or internal environment or by natural, sociopolitical, economic, or technical transformations. To thrive in the face of the demand for change, the system must quickly alter its structure and behavior to operate effectively under the new conditions.

## Group Discussion

New sciences such as genomics and complexity science, advances in older sciences such as pharmacology, and technological developments are conspiring to change the health services format. What is currently in place will be deconstructed, and newer structures and models need to be conceived. Brainstorm the dramatic changes affecting health care at this time. Then discuss how they will alter the design of health services. What might some of the new designs be and how will they change the use and location of healthcare providers in the health system?

Much of what is happening in health care is revolutionary in nature. The very foundations of health care are being transformed by the impact of new technologies, in the realm of computers and the Internet, robotics, pharmaceuticals, and genomics, and sociopolitical and economic reforms. Technological advancements are so pervasive and influential that, in concert, they are fundamentally altering health therapeutics as well as the delivery of health services. The same can be said for the sociopolitical and economic forces. In particular, health services are less “bed based” than they were previously, the structures of hospitals and other healthcare organizations are being radically transformed, and providers must seek new ways of offering services that demonstrate effective health outcomes within a cost- and service-value chain.

The role of healthcare leaders is to focus on the implications of the revolutionary changes of health reform, including the implications for the behavior of those who work in the healthcare fields. Leaders must help other healthcare professionals to adapt to the changes and must position healthcare organizations to continue to thrive in an emerging value paradigm. They must discern the new roles, processes, and behaviors that will be necessary for future success.

The current transformation in health care is attended by changes in other conditions that challenge healthcare organizations to alter their way of business. For instance, the environment will require these organizations to reconfigure supporting structures and finances because the older configurations have become severely stressed in a way that threatens them. A further threat is presented by the fact that while the supporting infrastructure of economics, policy, and work is being reformed, the existing structures and behaviors will be even less effective than they were previously.

Here again, the leader of a healthcare organization must recognize the critical nature of the shift and undertake the dramatic and sometimes perilous process of quickly revising structure, processes, and behaviors to become more congruent with the emerging demand for sustainable health value (**Figure 2-5**). Besides reading the signposts of the change accurately, the leader must begin to create a sense of urgency about the change in the minds of those who will live in this new world. The issue that creates the drama and suspense is whether everyone’s responses will be timely and appropriate. The leader must move people quickly through mourning the loss of established rituals and routines and raise the stakes for thriving and advancing the work in the context of a new set of reforms.



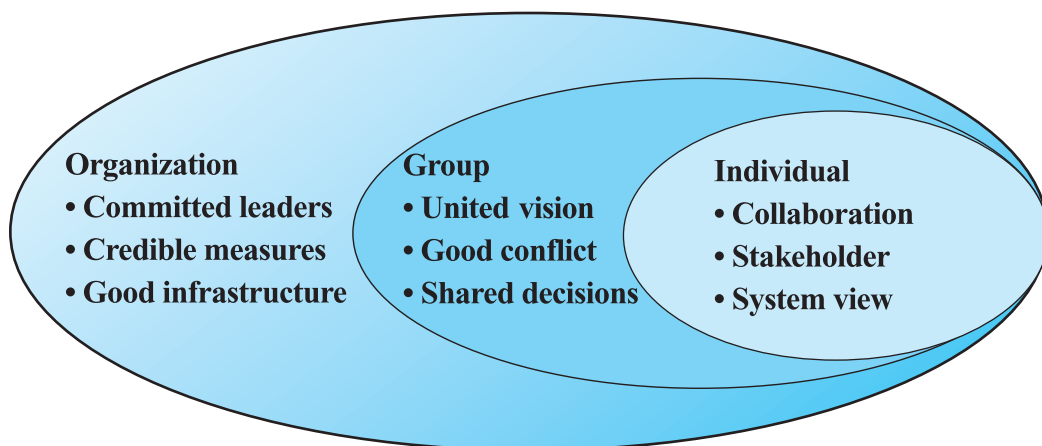


Figure 2-5 Organizational Levels and Associated New Age Characteristics.

### Key Point

Leaders are agents of change. They bring the vision and context of change to the stakeholders so that the latter can develop the content of change.

In a time of revolution, all the principles of adaptation and complexity management come into play. The leader’s ability to apply these principles and bring the elements of complexity and chaos together determines whether the organization thrives. As an agent of change, the leader knows that a variety of “agents” in a system can stimulate action or change. The leader is always

looking for how these agents act to create the critical events that lead to an adjustment or a transformation.

The leader also knows that there is a variety of choices and strategies that can create a good fit between the demand for reform and our response. The leader looks for the relationships in the demand for change. By paying attention to the themes and mosaic that best demonstrate the flow and impact of the patterns, the leader can facilitate the making of good decisions and the undertaking of effective actions.

There is both substance and artifact in all change. The leader’s role is to sort through the options and determine which elements are evidentiary and which are simply “noise” representing the change itself. The leader does not discard the artifacts of change but instead determines their value and uses them either as tools of change or symbols of the journey itself. These artifacts may tell the participants where they are in the journey and may also provide help in getting through the journey’s various stages (Boje, Burnes, & Hassard, 2012).

Testing the way of the transformation is as important as any other activity. Although many things that occur during a revolution are important, equal amounts of “stuff” are unhelpful or even obstructive. Furthermore, it is important to determine where the system is in the process of change—what has been accomplished and what has yet to be done, what the deviations are, and what the successes are. Consequently, a means of measurement is needed so that the agents and strategies selected can be validated against the distance traveled and so that the expectations can be compared with the reality (Figure 2-6).



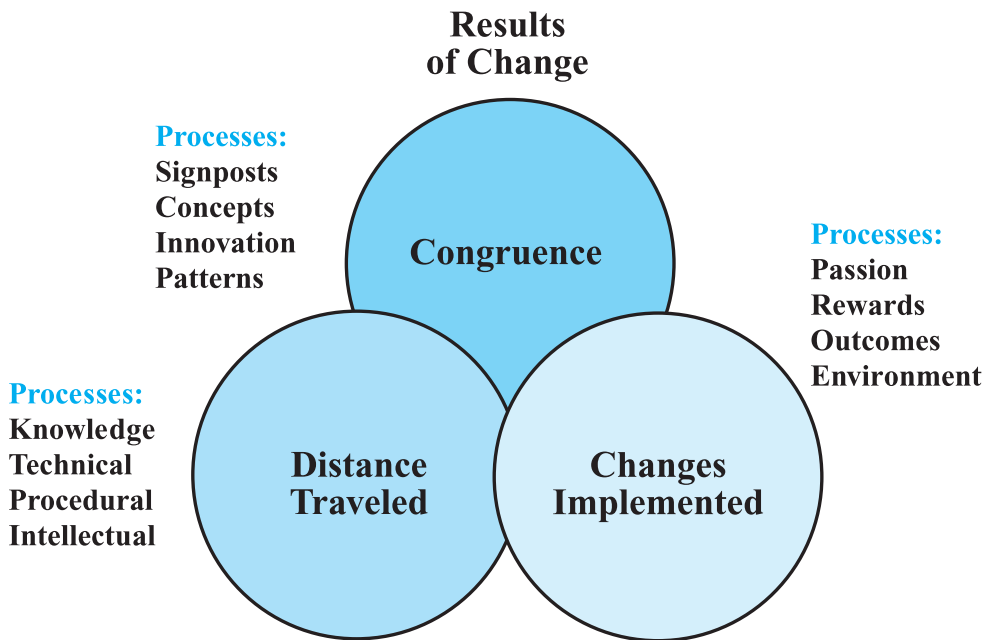


Figure 2-6 Evaluating Transformation.

Exploration and experimentation are essential elements of any major change. The context is often significantly different from what was previously experienced or lived, and as the context changes, so too do the rules. Both the journey and the way of living that results from the journey are so different from the past that previous experience is inadequate to meet the new demands. The script gets written as part of the journey itself. This means that most of the change agents are learning about the change at the same time as they are leading the adaptation to it. This is especially true during a postparadigmatic change where the script is essentially new to all the players. Here leaders must successfully demonstrate their own capacity to learn, predict, and adapt as discernment, experimentation, application, and short-term evaluation yield data not previously available. When the script is written as it is lived, the collective wisdom garnered from the active engagement of all participants is critical to the assessment of effective progress.

Choosing strategies that fit the circumstances is not always easy to do. Because the ground shifts as people try to learn to live on it, the leader must have an open attitude regarding what is to be discovered. Leaders must understand what is meaningful and sustainable on the journey thus far and how it has been experienced. A leader's experience forms the database for the next stage of the journey.

At the same time, the leader experiments with actions. Because the leader does not know what the sustainable or valuable actions are until they are applied, the leader recognizes that there is an element of risk that must be embraced. All actions are prone to error. Indeed, the very risk of error advances the opportunity for learning and adaptation. Any particular error may contain the answer to a problem or at least be a signpost that could not be discerned in any other way, making the error a tool for the evaluation of direction and goodness of fit.

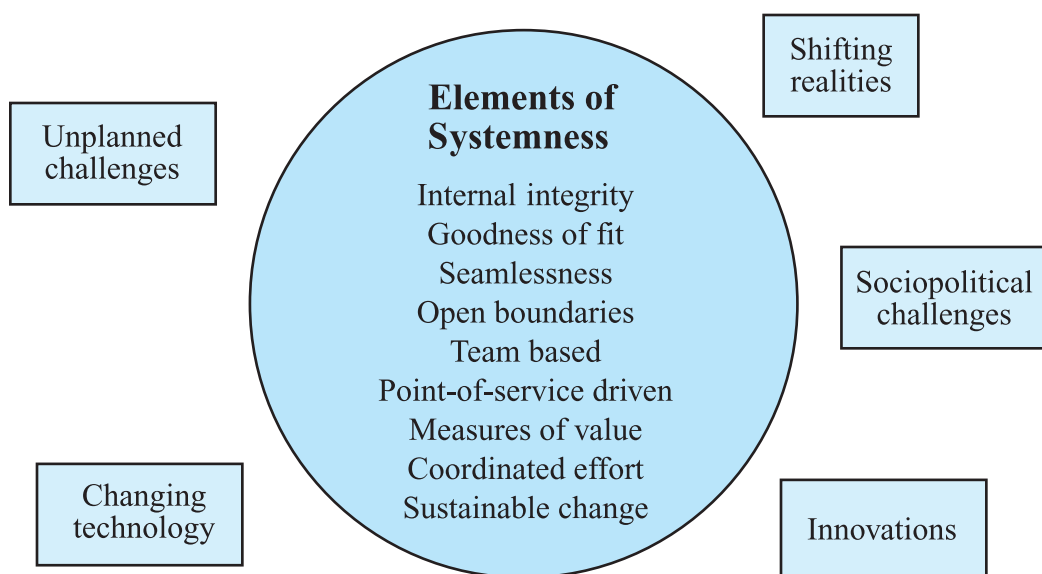


Figure 2-7 A System and Its Context.

In short, the leader sees everything within the context of systemness. All elements of a dynamic system are related and interact with each other, and the interactions, when aggregated, are what create the conditions for the system’s adaptation and ability to thrive. When internal need and external conditions converge, they create the demand for change and adaptation.

Leaders see systemness everywhere and recognize that they can play a major role in the system’s ability to adapt and improve (Figure 2-7). Whether a leader plays such a role largely depends on the leader’s ability to anticipate, live in the potential of, and embrace each change at the right time. In addition, the leader must realize that he or she is an important change agent and must always act out of that understanding.

To ensure that the system adapts appropriately to changes and continues to thrive, the leader needs to keep in mind the following:

- The leader must apply the skills of exploration and those of exploitation, and know when to apply each skill set.
- Throughout a period of change, the leader must know which processes accommodate and use inherent variation and which processes maintain stability and good order, and then use these processes appropriately. Some level of inherent stability and some normative forces help to reinforce adaptation, and yet innovative and creative solutions and strategies often are embedded in the chaos and variance. In other words, both stability and variability are essential for adapting to change.
- Knowledge of the inherent interactions of elements in the system can direct the leader to build on those intersections that bring coherence, integrity, and trust into the system. These features of systemness can enhance people’s ability to change and adapt quickly and well.

- All strategies have consequences. The leader must determine the appropriate strategies for guiding the system in the right direction. The implementation of these strategies must take into account that random influences may lead to valuable insights not available in any other way.
- Systems are membership communities. They operate through the consent of their members. The relationships among the members, including their communication with and support of each other, are as critical as any other factor for ensuring sustainable adaptation.
- Failure can be an important measure of direction and change. It should not, however, be an uncontrollable factor and should operate within the context from which it emerges. Small changes should not contain large failures. If they do, that indicates that the associated strategies are ineffective or misconceived.
- The team is the basic unit of work, and the relationships among the core members drives all successful change. Here is where change gets lived out and applied. The interaction, relationship, and competence of the team members are essential to the viability of the team's work and the sustainability of the system. In human systems, all else exists to support the work of this unit.
- Small changes lead to big changes. Further, all changes affect the system as a whole, either individually (evolutionary change) or in the aggregate (revolutionary change). It is not possible to affect any part of a system without ultimately affecting the whole system.

Crisis and creativity frequently emerge in unanticipated places and ways. Often in the act of achieving something else the creative and innovative arise. Leaders must always be open to serendipitous and emergent forces that arrive unexpectedly.

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## Conclusion

The presentation of principles in this text is neither exhaustive nor fully developed. This chapter serves merely as an introduction to concepts important to leaders in the Information Age, who must operate using different ideas than those common in the Newtonian-inspired Industrial Age. Leaders must review the adequacy of their skill sets in light of the realization that the era of unilateral and vertical orientation of functions is quickly passing.

Dramatic and dynamic changes continue to affect the leadership role. To understand this role in the new age of work and reform, leaders must learn about quantum principles and how they are to be applied. They must also become adept at understanding biologic metaphors, which are much stranger tools of thought than the old machine- and building-based metaphors. Permanent structures are no longer good models for work, especially in health care, and the architectural infrastructure characteristic of the coming age has a value-based format within an information infrastructure. Leaders must devote their full energy to pulling people out of work and service models that no longer operate efficiently and placing them in a context that demands thinking and acting in radically new ways.

It is interesting to note that, in recent times, people have not become more isolated. In fact, the opposite has occurred. Human beings have more potential for relationship and

connectivity than at any time in history. The tools of connection and communication are creating linkages that were once only dreams. Living in this kind of a world, however, brings its own set of challenges and requires a different way of relating and behaving.

Leaders have an obligation to move people and structures into the new framework for work and leisure. To do this, they need a different mental model, new tools and skills, and a genuine desire to move both themselves and others into the new age. They need new knowledge, true enough, but they also need excitement so encompassing that others can see it and feel it, be energized by it, and develop the hope and enthusiasm necessary for creating a sustainable future.

When all is said and done about leadership—and these days much is said about it—it is important for every leader is to engage with and embrace the script of life and to get others to do the same so that the conditions of life are improved. Through discernment and exploration, design and formation, experimentation and application, leaders can help foster the richness of experience that enhances the quality of life for all. The effort to make life better and the chaos out of which improvements emerge give form to the leadership role. The process of discerning and drawing from the complexity of all systems the simplicity that lies at their center and applying that simplicity to the lives of others gives critical substance to the work of every leader.

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## Case Study 2-1



### Creating Change in the Midst of Chaos

Nancy has been the CNO at Shady Point Hospital for 15 years, but this last year has been the most difficult for her. It seems as if there has been one change after another this year, and Nancy is tired of trying to lead the nursing staff through the changes, making sure the physicians are satisfied, and ensuring that the patients receive the best possible care. It seems that the staff are fatigued with all the changes and meetings as well, and some have said, “We just want to be nurses and take care of patients.” It was easier in the past—the hierarchy and structure of the hospital seemed to provide some stability. Nurses were content to work at Shady Point for their entire careers, and nearly 50% of the nurses had been there 15 years or longer. Some of the nurses actually had trained at Shady Point’s nursing school, a diploma school that closed 25 years ago.

Feeling the pressure from other hospitals’ CNOs in the Northwest Healthcare System, Nancy has been investigating what it will take to commence the Magnet journey. In preparation, she has hired a director of professional development and research who has a doctoral degree from a respected university. Although it seemed like a great idea in the beginning, she notices now that the nonproductive education hours are completely over budget and the CFO is pressuring her to correct the problem. The new director of professional development is encouraging the nurses to develop career plans, return to school, and to become certified. Now, many of the nurses who feel like they should return to school to get a bachelor’s degree or certified in their specialty are demanding more support for tuition reimbursement, increased pay after they obtain their specialty education, and some paid hours for attending classes. Nancy is overwhelmed with all the demands and changes and the pressures she feels from the rest of the executive team to stay in

budget and to improve the nurses' satisfaction levels. The entire organization seems to be in a state of chaos under demands to reduce operating expenses while the staff and physicians are demanding more and more. Nancy typically holds things "pretty close to her chest" and tries to manage the nursing department on her own without sharing many of the details with her team of directors.

At wit's end, Nancy seeks the counsel of a colleague in a neighboring state who has led his hospital through complex times and even led the nursing staff to Magnet designation. He advises her to reach out to her colleagues on the executive team because the nursing department is core to the business of the hospital. He thinks that she needs to create a shared sense of responsibility for the changes that are occurring in the hospital and in nursing and to work toward a better understanding of how a satisfied nursing staff influences patient outcomes, physician satisfaction, and departmental relationships. He also advises her to develop her own directors to work together as a high-performing team and to be more transparent about the pressures she feels to meet operating targets. They talk about her adjusting her own attitude to the job with a goal of creating new mental models about the demands. Perhaps she could consider them more as challenges that need to be solved rather than impossible situations.

Just talking about all that she has faced seems cathartic and speaking out loud about the problems seems to give her new direction. She realizes that some people would have simply entered into her negative feelings and either advised her to seek a different job or pitied her situation. Nancy is grateful for her colleague's honesty, and she tells him how much she appreciates his boldness and encouragement of her reaching her full potential. They agree that she will keep in touch with him and that he will mentor her over the next few months. She takes some time off to relax and think things through, and she is actually surprised to feel excited to return to work again.

Nancy arrives at work with a new sense of commitment and resolve. She calls together the directors of the various nursing departments and the director of professional development and research and talks with them about her vision to transform the nursing division. She shares her concern that obtaining Magnet designation will be a huge challenge in the economic climate of the hospital. She is very frank with the directors about all that needs to occur and asks them to join her in this endeavor. Some of the directors are very excited about the possibilities of changes in organizational structure, advancement of the staff capabilities, and transformation of the organization to a high-performing one. Nancy asks the director of professional development and research to do a gap analysis of the organization's current capabilities in comparison to the Magnet requirements. She also asks that the directors work together as a team to identify strong nurse leaders among the staff who can compose a new Magnet steering committee. Nancy shares her vision that the Magnet steering committee should design the collaborative governance structure for the nursing division, and that the directors should act in roles as consultants instead of designing the structure themselves. The director group soon realizes that Nancy's style of leadership has changed dramatically since her vacation, and they are excited and uneasy about the changes she outlines.

Nancy also meets individually with the COO, CFO, and her CEO to share her concerns about the across-the-board budget cuts that negatively affect the nursing

division and, ultimately, patient care quality. She shares a plan of how to reduce expenses while preserving the professional role of the nurse as the team leader in the planning and implementation of patient care. She tries to develop a shared vision among her colleagues so they will be invested in her plan to develop and advance the nursing division, but also see her as responsible and accountable for the financial integrity of the overall organization. Nancy also meets with the other divisional leaders to discuss how their roles intersect in meeting the organization's goals and financial targets.

As part of the transformation of the nursing division, Nancy works with her direct reports to discuss different leadership styles and leadership theories. She introduces them to concepts such as the servant leader, transformational leadership, and motivation and change theories. She recommends that the directors who do not have master's degrees in nursing leadership consider returning to school, and she offers them one day off per week to attend classes. She still expects them to meet their productivity and financial targets and other quality indicators, but she sees the potential in each individual and is confident that the directors will be able to accomplish their roles at the hospital and their new student roles. All the while she is speaking, she is constantly observing the directors' body language, facial expressions, and reactions to her thoughts on expanding their knowledge, skills, and capabilities in leading high-performing teams. Although she realizes that there is some risk in asking her direct reports to return to school while working full-time, she is confident that their exposure to new knowledge will also expand their success at work. She reassures them and lets them know that she is available at any time to talk with them about their fears and concerns. She also encourages them and particularly the director of professional development research to motivate the staff nurses with diploma and associate degrees to also continue their education toward the bachelor's degree. Nancy indicates that she is in negotiation with one of the local universities to provide some of the education on site at the hospital to facilitate the nursing staff and directors furthering their education. She shares that she is also working with Human Resources, her executive colleagues, and the Shady Point Foundation to develop nursing scholarships and tuition reimbursement up to \$1,000 per person per year.

After a few months, Nancy reflects on all the changes that are occurring at Shady Point Hospital and the pressures she continues to feel to be a good steward of the hospital's resources. She feels excited about the transformation she is witnessing in her directors and the staff as a whole. She also feels more connected with other divisional leaders and the executive team, and although they don't always agree on solutions to problems, they do agree to work as a team to accomplish their shared goals. Changes are coming fast, but Nancy has found strength within herself and her director team that she never dreamed possible.

### Questions

1. Who are the stakeholders in this case? Analyze the case by taking on the role and perspective of each stakeholder.
2. How can Nancy possibly lead Shady Point to thrive in the face of the organizational chaos and complexity?



3. What strategies would you use to prepare the nursing team for a Magnet application?
4. What should Nancy do to sustain the gains she has seen in teams at Shady Point?
5. What strategies can a leader employ to create a shared vision?

## Case Study 2-2



### Developing Service Lines in a Healthcare System

Ella has been the executive director of the Women's and Children's Hospital for the past 10 years at Best Health Memorial Hospital, which is the flagship hospital in a major healthcare system. Five other hospitals in the healthcare system are located within a 50-mile radius of Best Health Memorial Hospital. As executive director, Ella provides leadership to approximately 600 professional staff members who report directly to 12 different managers. The managers also report to 5 directors who provide leadership for the women's surgical areas; labor, delivery, recovery, and prenatal services; maternal and infant services, and neonatal intensive care services. In addition, one director is responsible for professional development and research and supervises the clinical nurse specialists who are assigned to each of the clinical areas.

Ella reports directly to the CNO, who also is responsible for executive directors of other major divisions including acute care (including oncology, orthopaedics, and general medical-surgical care), critical care and emergency services, rehabilitative services, and home health and hospice services. Ella is one of four nurse leaders who direct women's and children's services for the hospital in the Western Regional Health System. The Women's and Children's Hospital at Best Health is the largest in the healthcare system, and the other hospitals include the following: (1) one suburban hospital with a small delivery rate of approximately 900 annual deliveries; (2) one urban hospital with an annual delivery rate of approximately 1,500; (3) an urban hospital with an annual delivery rate of approximately 3,500 and a level II neonatal intermediate intensive care nursery; and (4) one suburban hospital located approximately 50 miles from Best Health with a strategic plan to develop a new maternity service line with a level II neonatal intermediate intensive care nursery. All of the other hospitals have transfer agreements with Best Health's Women's and Children's Hospital for high-risk perinatal and neonatal transports for tertiary care. Beyond the transfer agreements, there is very little coordination of efforts or sharing of resources among the five hospitals.

Ella has assumed the informal leadership among the other directors of maternity and newborn services at the other hospitals, and she is respected for her national reputation as a leader in women's and children's services. Ella is a frequent speaker at the national conferences associated with maternal newborn health and children's health services. She has recently attained her PhD in nursing with an emphasis on nursing leadership, is certified by the American Nurses Credentialing Center (ANCC) and the American Organization of Nurse Executives (AONE) in nursing leadership, and is certified in high-risk perinatal services by the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). Ella is also a frequent contributor to journals specific to maternity, newborn, and women's services.

The president of Western Regional Health System and his executive team have decided to develop specialty-focused service lines for women's and children's services, cardiac services, orthopaedic services, and cancer services. Other service lines will be developed in the future depending on the effectiveness of these four service lines in reducing variation in care, redundancy of services, and costs associated with patient care protocols. It is also hoped that the service-line structure will improve market share and recognition for excellence with improvements in quality outcome indicators, physician and patient satisfaction, and coordination of care across both inpatient and outpatient services related to each of the specialties. To initiate the vision for service-line integration, four corporate vice president positions are announced with star performers in each of the service lines selected for the new role.

Ella, the star performer for women's and children's services, was appointed as the corporate vice president (VP) for women's and children's services. Although surprised and excited about this new role, Ella had mixed feelings about leaving her executive director position at Best Health Memorial Hospital's Women's and Children's Hospital. She and the other newly appointed corporate vice presidents will be relocated to the corporate offices rather than having an office at any one of the five health system hospitals. A new executive director will be recruited for Best Health's Women's and Children's Hospital. The president of Western Regional Health System announced the new organizational structure, vision for system integration, and a newly appointed senior vice president for Service-Line Integration position. The new senior VP is a physician who was recruited from an academic position on the East Coast and who has some experience with a large healthcare system developing a service-line structure. All of the new corporate VPs report directly to Dr. Thomas, the new senior VP.

Needless to say, these organizational changes create absolute chaos among each of the entity hospitals' executive and leadership teams because they are uncertain how the new system structure will affect their strategies and decisions related to the service lines within their own entities. Some of the executive and leadership teams are fearful that they will lose autonomy in decision making related to the service lines. The leaders of the smaller hospitals are pleased that they might have more resources allocated to them as a result of the system change because they often did not receive as many resources as were allocated to the larger hospitals in the system.

There is significant scuttlebutt around the organization as to how the corporate VPs were chosen independent of the usual process of opening positions and allowing inside and outside applicants to be considered. The unilateral decision by the president and his executive team upset many of the leaders in the healthcare system, who voiced concern that this same process might be used for other key positions in the future. Several are concerned that their own power and authority base will be undermined by these newly appointed corporate VPs and ultimately by the senior VP for Service-Line Integration. The entity leaders are also concerned that their roles and responsibilities in physician recruitment, program development, financial management, and philanthropy will be minimized with the new service-line structure.

The chaos and confusion regarding the new organizational structure are often blatantly apparent at the system-wide executive meetings chaired by the president of Western

Regional Medical Center. He finally informs the CEOs of each of the entities that they must put a positive spin on their communication to their leadership teams as well as the staff at each of their hospitals. He provides as much information as possible regarding the position descriptions for the senior VP and the corporate VPs and has several open discussions about his vision for service-line integration across the system. He also suggests that the CEOs read several articles written by national leaders in healthcare integration and authors of books on “systemness.” Over the next months, the president invites national speakers to present at Western Regional Healthcare System’s corporate offices with invitations for the entity leaders to attend and discuss system integration that has been successfully implemented at other major healthcare systems throughout the United States.

Ella becomes excited about her new role, and she reads everything possible about vertical and horizontal integration of healthcare systems. She begins to meet with the new senior VP and the other corporate VPs who are now her peers. Her position description includes service-line development, integration, and innovation with an emphasis on improving quality and financial indicators by reducing variation and redundancy. She also meets with data analysts to assess the volume, financial, and quality outcome data for each of the entities. Because she had enjoyed a very positive relationship with each of the entity’s directors of Women’s and Children’s Services, she expects to continue this positive relationship in her new role. She also meets with the CNO who was involved in the development of new women’s and children’s services at the outlying hospital.

When she meets with each of the directors at the respective entities, she is surprised to receive a less than positive reception. Suddenly, her colleagues who had worked with her so well in the past seem distant and negative in their interaction toward her and her ideas related to service-line integration of women’s and children’s services. With the exception of the CNO who was developing women’s and children’s services from scratch, the others strongly emphasize their desire to maintain their autonomy in the direction of their services instead of centralizing decision making related to women’s and children’s services. It seems to Ella that they have no concept of the president’s vision for service-line integration or what systemness would look like. Despite her frequent meetings with them and developing an organizational structure for women’s and children’s services with them, she seems to receive only cordial and superficial coordination of services rather than a commitment to true integration.

Ella’s experience is not unique, and the other corporate VPs report similar reactions with the exception of the orthopaedic service line. In one of the service-line meetings, Ella mentions that the hospitals are acting more as a confederation of hospitals rather than as a healthcare system. Each of the entity hospitals struggles to maintain as much autonomy in decision making as possible while the corporate system leaders attempt to integrate service lines to create a total and comprehensive system of care for the community with branding of the Western Regional Healthcare System as a name for healthcare excellence.

The orthopaedic service line seems to be more advanced in its integration of services because there are few threats among the orthopaedic surgeons and nursing

leadership at each of the entity hospitals. They see system integration as an opportunity to obtain more resources for capital equipment, marketing and promotional services, and specific leadership for the specialty beyond the current immersion in general acute care services at each of the entities. The cardiac service line struggles with the system integration initiative because each of the entities desires to be named the premier cardiac center within the healthcare system, and several of the interventional cardiologists are direct competitors for market share within the region. Because there are two cancer centers in the healthcare system, the cancer service line also struggles with how to manage competing centers of excellence with physicians and leaders who have no incentive to integrate their services or referral systems. In fact, physician and entity leaders for the cancer service line voice their discontent with the system initiative, stating that it reduces their ability to enhance their market share coming from the smaller hospitals within the system.

Ella continues to review the literature related to the development of systems in general and healthcare systems specifically. She realizes that for the women's and children's service line, she needs to demonstrate the value that could be added by the integration of services across the entities in contrast to each entity acting alone. She also realizes that it is important to identify areas where autonomy in decision making is legitimate and to support each of the entity leaders in their efforts to maintain entity autonomy in their specific region within the city. She recognizes that it will be difficult for each of the entities to give up its respective individual branding within its community, so she advocates at the system meetings for the development of a system brand that also allows for entity branding as a developmental step in the overall goal of system integration. Because each of the entities also provides services to different cultural groups, Ella suggests that these diverse cultures be highlighted in the branding of each of the entity's programs and services. This action recognizes each of the entities for a unique contribution to the system as a whole.

Several different actions and initiatives to develop system integration are tried, and many succeed, whereas others are not so successful. Ella tries to analyze the forces at play in each of the successes and failures. One area that is very successful is the development of a system organizational structure for women's and children's services for the service line that was designed by the entire group of entity leaders. System-wide councils were developed using successful models of shared governance reported in the literature. The following councils were developed: (1) Operations Council, which focused on financial and productivity goals and supply and capital acquisitions; (2) Quality Council, which focused on nurse-sensitive indicators and other quality outcome indicators; (3) Professional Development and Education Council, which focused on integrating orientation and on-boarding, professional development courses, and preparation for specialty certifications; (4) Research and Innovation Council, which focused on developing system-wide research projects, evidence-based practice projects, and new innovations that could be shared among the entities; and (5) Patient and Family Education Council, which focused on the integration of all educational materials for patients and families and the standardization of clinical protocols for patient education across the system.

Ella led the process of developing each of the councils with respective charters, deliverables, and reporting structure to a system-wide steering council composed of physician leaders in women's and children's services and the entity directors at each of the hospitals. It seems that over time the entity directors moved from simply coordinating efforts at each of the hospitals to actually working toward integrating some of their professional education offerings and patient education materials and activities. They also began to assume responsibility in developing a new women's and children's service program at the outlying hospital. Ella begins to realize that system integration could not simply be mandated by system leaders but rather that systemness is a developmental process. Reflecting over the past few months, Ella notes that moving toward systemness has several identifiable steps that include developing trust among the service-line and entity leaders, sharing information and resources across the hospitals, coordinating services and programs across the system, and, finally, developing strategic thinking from a systems perspective instead of the individual entity level.

### Questions

1. How do you think that the president's announcement to move to a service-line platform and the centralized decision to appoint service-line vice presidents in contrast to an open recruitment process affected the system service-line initiative?
2. What do you perceive the differences are between a confederation of hospitals and a fully integrated healthcare system?
3. How would you strategize to minimize the fears and anxiety of entity leaders in the development of a system-wide service line?
4. In this case, what are the apparent barriers and contributors to system integration for the service lines?
5. In your opinion, how much autonomy in decision making and marketing and promotions should each entity have in an integrated healthcare system?
6. What are the factors that might affect the decision to honor entity autonomy in contrast to system integration and centralization of decision making and marketing and promotional activities?

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## Quiz Questions



Select the best answer for each of the following questions.

1. Change can be defined as a dynamic rather than as an event. This means that change is \_\_\_\_\_.
  - a. Cyclical
  - b. Periodic
  - c. Timely
  - d. Continuous
2. Complexity science is based on a new understanding of the operation of the physical world. What is this understanding referred to as?
  - a. Newtonian physics
  - b. Quantum mechanics
  - c. Universal science
  - d. The Einstein principle
3. A number of converging forces have ushered in the new age. The three main forces converging are sociopolitical, economic, and \_\_\_\_\_.
  - a. Technological
  - b. International
  - c. Scientific
  - d. Commercial
4. Systems are dynamic entities driven more by relational elements than by functional processes. In this way, which of the following do they resemble?
  - a. Biological structures
  - b. Business structures
  - c. Social structures
  - d. Information structures
5. In a healthy system, 90% of decisions are driven by which of the following?
  - a. The top of the system
  - b. The bottom of the system
  - c. The point of service
  - d. The managers
6. According to complexity theory, anything that adds value to a part of the system adds value to the whole system. Which of the following is an implication of this principle?
  - a. Each part of the system drives the work of the whole system.
  - b. The whole system is the only legitimate source of sustainable value.
  - c. All real value derives from the work of the people in the system.
  - d. Every component of a system contributes to the integrity of the whole system.

- 7. In complexity theory, how is chunking defined?**
  - a. It is the support provided to a complex system by the operation of simple systems.
  - b. It is the formation of a complex system by the incremental aggregation of interacting and interdependent simple systems.
  - c. It is the operation of a complex system consisting of independent parts.
  - d. It is the dynamic relationship between independent simple systems.
- 8. Diversity is essential to change for which reason?**
  - a. It creates the variety required by change.
  - b. It accentuates the similarities that exist through change.
  - c. It makes chaos visible and underscores the need for adaptation.
  - d. It highlights the difficulty of reconciling differences.
- 9. Error is also essential to change. Not all errors are acceptable, however. Which of the following errors are to be avoided?**
  - a. System-based errors
  - b. Errors in judgment
  - c. Repeated errors
  - d. Human errors
- 10. Systems are driven by different rules than are functional institutions. Which of the following are the cornerstones of systems design?**
  - a. Relationships and intersections
  - b. Functions and actions
  - c. Policies and processes
  - d. Rules and regulations
- 11. To ensure the system's vitality, the leader of a system must pay special attention to which of the following?**
  - a. Stability
  - b. Chaos
  - c. Form
  - d. Function
- 12. When does revolution in a system occur?**
  - a. When the pace of evolution is insufficient for the necessary changes
  - b. When things cannot continue to operate in the same way
  - c. When violence is introduced into the system
  - d. When many local changes occur at once