Organizational Transformation: A Model for Joint Optimization of Culture Change and Evidence-Based Design

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Abstract

Healthcare organizations face continuous and accelerating external change and thus must be prepared to manage their own change initiatives proactively. Given that many believe that the U.S. healthcare system is broken and most healthcare organizations are dealing with pervasive problems, some organizations may choose to seek transformational change to achieve the six aims identified by the Institute of Medicine: healthcare that is safe, effective, patient-centered, timely, efficient, and equitable. Transformational change will almost certainly involve organizational culture. Culture change may be most effective when linked to other organizational change initiatives such as organizational strategy, structure, policies, procedures, and recruiting. Significant organizational change often requires accompanying facility change. There is an interdependent relationship between facility design and organizational culture. They affect each other and both impact organizational performance. Sociotechnical theory promotes joint optimization of the social (culture) and technical (facilities) aspects of an organization to achieve sustained positive change. To achieve organizational transformation and to sustain positive change, organizations must be prepared to adopt collaborative efforts in culture change and facility design. The authors propose a model for accomplishing joint optimization of culture change and evidence-based facility design.

Key Words: Healthcare design, evidence-based design, culture change, organizational transformation, joint optimization model, design process, architecture, strategy, culture design, culture of safety, patient-centered care, family-centered care

Healthcare organizations continue to experience accelerating change. Changes in medicine, pharmacology, technology, the availability of work force, patient demographics, and capital and operating finance along with governmental regulation are among the many influences on today's organizations. Changes in the healthcare industry trigger the need for changes in organizational strategy. Changes in strategy may call for changes in the structure, policies, and procedures of an organization. In some cases, organizational culture must adapt to achieve new objectives. Physical facilities, infrastructure, systems, and technologies may also need to be adapted for the new strategic direction. One could say that the effectiveness of an organization depends on nimble strategic responses to external change, and that both the social and technical aspects of an

organization must be in alignment with the strategy adopted to address the challenges of the external environment.

The healthcare system in the United States has been described as broken and in need of complete transformation. Although change initiatives take many forms, attempted piecemeal or in an uncoordinated fashion these initiatives are often less successful than might be hoped. These initiatives can effect change, but they rarely result in organizational transformation. In the face of such challenges, how can an organization plan for effective and profound transformational change?

When organizational strategy calls for a total transformation, it is likely to involve culture change. Many culture change initiatives result only in temporary change, until the organization slowly returns to its original cultural condition. Sustained change in culture requires a comprehensive, integrated strategy and a serious, longterm organizational commitment to a changed management process. Sociotechnical theory tells us change is most likely to "stick" when the social and technical aspects of an organization can be jointly optimized through concurrent, coordinated change programs. This paper describes a Joint Optimization Model that maximizes the integration of culture change initiatives and facility design to achieve a transformational outcome that supports the mission, vision, values, and culture of an organization.

Significance

The subject of this paper is the positive synergy available to organizations that engage in simultaneous initiatives addressing culture change and facility design. Facility change is usually permanent, or nearly so. Physical change can support new processes and systems while enabling and enhancing actions and behaviors that move the organization toward its new objectives. A major advantage of a design intervention is that it can encourage and support new behaviors and work- flow, or physically inhibit a return to undesired actions or behaviors. If existing organizational structure and culture are simply transferred unchanged to a new setting, the opportunity for optimization is forfeited. Expecting culture to change without an accompanying environmental change can result in unanticipated opposing forces.

Organizations capable of transformative change can positively impact the quality of the patient experience, while creating safer healthcare delivery in their communities, more effective work environments for their employees, and a positive future for the broader healthcare system. The authors pose the hypothesis that effective transformational change in healthcare organizations is most likely to be sustained when culture change and facility design initiatives are jointly optimized. This hypothesis is accompanied by a conceptual Joint Optimization Model for continuously coordinated change affecting both the social and technical aspects of an organization.

Review of Literature

There is a body of literature associated with culture change in healthcare organizations. There is another body of literature associated with evidence-based design in healthcare facilities.

Relatively little has been produced on the subject of the important relationship between facility design and culture change. The concept of joint optimization is borrowed from sociotechnical theory to introduce the transformational potential of coordinated cultural and facility change efforts.

Culture Change

Values, artifacts, symbols, and assumptions are wellaccepted elements of culture (Hatch, 1997; Schein, 1992). Although culture is resistant to change, any of these elements can be active sources of culture change.

Figure 1 oversimplifies the interdependencies of culture elements. Changes in organization systems such as care delivery practice models will depend on values. Change in one element is held in check by the other elements. If new values are introduced into an organization through a merger, or a new leadership team, then the assumptions and expectations may also change. However, in his discussion of organizations with strong value sets and failed change efforts, O'Toole (1996) warns us, "effective change builds on the existing culture. A group [with strong values] will reject a foreign system of values the way a healthy body rejects a virus" (p. 76).

?to successfully manage organizational culture, strategists must manage cultural artifacts. Cultural artifacts include myths and sagas about company successes and the heroes and heroines within the company; language systems and metaphors; rituals, ceremonies, and symbols; certain physical attributes such as the use of space, interior and exterior design, and equipment; and the defining values and norms. (Higgins & McAllaster, 2004, p. 63)

Assumptions are often illusive and difficult to change because they are rooted in what people believe works. If a new practice model does not work, it may not influence assumptions or be adopted as part of the culture (Schein, 1992). If a new way of doing things works, it will become a part of the assumptions and no longer be a part of conscious thinking. Shared assumptions allow organization members to function together and know what to expect from each other. In order to change assumptions, each individual must intentionally engage in reflective negotiations that might result in confusion and discomfort as beliefs are dismantled. Kurt Lewin (1947) said, "If one wants to understand a system, one should try to change it" (in Schein, 1992, p. 194).

Anyone who has tried to assess and evaluate culture, establish goals and a vision, plan organizational interventions, and implement them, knows that it is not simple. Scott, Mannion, Davies, and Marshall (2003) found "Key factors that appear to impede culture change across a range of sectors include: inadequate or inappropriate leadership; constraints imposed by external stakeholders and professional allegiances; perceived lack of ownership; and subculture diversity within health care organizations and systems" (p. 111). Subculture diversity refers to coexistence of professional cultures, cultures of international origin, generational cultures, and cultures specific to particular work units. Any movement to change culture must consider what that really means for all coexisting subcultures.

Each subculture has a storyline used to make sense of its experiences. If a hospital announces a new facility, one story might be: Our leadership is listening and understands the need to upgrade our work environment; they must have noticed those low scores on the employee satisfaction survey. Another story might be: That new vice president is pushing for a new image and trying to recruit physicians for money-making services; money is all they care about. In other words, the same action can generate diverse responses. Part of a successful culture change is aligning the stories that are told about the actions taken in the course of change.

The call for change in culture in healthcare is more often stated as creating a culture of learning, developing a culture of reporting, or initiating a move from a culture of blame to a culture of safety (Dickey, Damiana, & Ungerleider, 2003). Particular attributes of the desired culture are commonly targeted for change. For example, the hierarchical nature of most healthcare environments has been identified as working against a culture of safety (Mizrachi, 2001; Weinstock, 2007). Initiatives to reduce hierarchy may require a change to all of the core cultural elements including values, systems, assumptions, and even a change in physical layout.

Culture of Safety

Healthcare literature routinely refers to the milestone Institute of Medicine (IOM) report that revealed that as many as 98,000 patients die every year because of preventable medical errors in U.S. hospitals (Kohn, Corrigan, & Donaldson, 1999). The National Academy of Sciences has identified organizational management practices, workforce deployment practices, work design, and organizational culture as threats to patient safety in the nursing environment (Page, 2004). Healthcare systems have responded by investing in a variety of technology and process solutions including practices, procedures, structures, physical redesign, and management philosophies. Many of these interventions call for a "culture of safety." Researchers have started to measure systematically aspects of hospital safety climates and physical environments (Blegen, Pepper, & Rosse, 2005; Connelly & Powers, 2005). The Agency for Healthcare Research and Quality (2007) is currently in its second year of reporting nationwide results from a Patient Safety Culture survey that polls the opinions of frontline staff on items such as teamwork and nonpunitive error reporting. Cross-system committees and consortium-level initiatives have been formed to research and address patient safety jointly (Rutherford, Lee, & Greiner, 2004; Singer et al., 2005). As can be inferred from the broad range of efforts, creating a culture of safety is not a clearly defined task.

St. Joseph's Community Hospital, West Bend, WI

The board and chief executive officer (CEO) made a commitment to design "the safest hospital in America." They adopted a strong culture of safety in combination with a supportive facility design to create what they contend may be the safest hospital (Reiling, Breckbill, Murphy, McCullough, & Chernos, 2003). They convened national safety experts from multiple fields, produced 10 recommendations "to enhance patient safety through design," built mock-ups of patient rooms, and adopted Failure Modes and Effects Analysis (FMEA) techniques from other industries to test their planning.

In hospital design, as in other industries, it is easier to fix potential failures during the planning stages than after construction has begun. Each design team was asked to conduct FMEAs around their designs at each stage and assure the patient safety design principles were addressed, including designing around precarious events. (Reiling et al., 2003, p. 143)

St. Joseph's is an example of leadership making a commitment to create a culture of safety. It illustrates how design of the physical environment can be leveraged to support a culture change.

Patient, Family, and Relationship-Centered Culture

Much has been written about the patient and familycentered models of care that many hospitals have adopted. Rathert and May (2007) reported that, based on nurses' perceptions, patient-centered care was positively related to nurse satisfaction and willingness to report errors, and negatively related to the frequency of medical errors. In their study on patient-centered care, Rutherford et al. (2004) noted, "Eliminating waste on medical/surgical units can mean anything from redesigning work processes to redesigning physical space. Learning to think more systematically about care processes, as well as more creatively, are key steps in changing the system" (p. 13). Safran, Miller, and Beckman (2006) studied organizational dimensions of "relationship-centered" care and claimed benefits of both a "culture of continual learning" and a "web of relationships" (over hierarchy).

In her Robert Wood Johnson Foundation white paper, Cultural Transformation in Health Care, Bobbi Kimball describes organizational culture as "the collective personality of an organization?a complex tapestry woven from the assumptions, attitudes, values, beliefs, collective memories and customs of an organization" (Kimball, 2005). Relationship-centered care and patientcentered care are often referred to as cultures, because these models encompass desired values and practices. To implement these models is a way to change the culture of an organization or subunit. Culture change at the practice-model level is changing what Schein (1992) referred to as "?the way we do things around here."

Organizations such as Planetree and the Institute for Family-Centered Care have been leaders in providing education and supporting demonstration sites as learning labs for change. The Planetree project began with a single experimental patient unit in San Francisco (Frampton, Gilpin, & Charmel, 2003). The original concept for the unit required organization designers to collaborate with the architect to create total transformation (Lindheim & Syme, 1983). Planetree's affiliates have chosen to adopt a new culture that emphasizes empowerment of patients and their families by means of access to healthcare information and active participation in clinical decisions (www.planetree.org). Planetree demonstrated profound culture change in the conversion to a patient-centered care model. It was also clear that facility changes were required to achieve the intended degree of transformation.

Evidence-Based Design

A growing body of literature describes how basing design decisions about the physical environment on credible evidence leads to improved healthcare outcomes (Hamilton, 2003b,

2004, 2006a, 2006b). Researchinformed design is beginning to be recognized as a positive trend, and healthcare organizations are now asking their design teams to use evidence-based methods.

Evidence-based design is a process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project. (Hamilton, 2006b, p. 31)

Scholars have been involved in reviewing available research to identify credible evidence relevant to design (Rubin, Owens, & Golden, 1998; Ulrich, Zimring, Quan, & Joseph, 2004). Based on the available evidence, Ulrich (1997) has proposed a theory of supportive design for healthcare that emphasizes reduction of stress, provision of personal choice, positive distraction, and attention to nature. Design professionals have employed the theory in practice and have been basing more of their design decisions on the findings of serious research.

Investments in evidence-based design elements have been shown through retrospective case studies and hypothetical compilations that combine results from several studies to have rapid paybacks, high returns on investment, and to make financial sense for an organization's financial decision makers (Berry et al., 2004; Sadler, Hamilton, Parker, & Berry, 2006). Detroit's Karmanos Cancer Institute, for example, documented "a 30% reduction in medical errors after installing acoustical panels and modifying medication areas" (Rollins, 2004, p. 338). Sadler, a hospital executive, has stated that appropriate facility design offers an important strategic advantage (2001). The Agency for Healthcare Research and Quality commissioned studies to explore the physical work environment, hours and staffing, and organization culture and climate with the assumption that improving the healthcare workplace would result in improvements in overall quality of healthcare (Gershon, Stone, Bakken, & Larson, 2004).

At St. Michael Health Center in Texarkana, one hypothesis associated with an early version of decentralized nursing positions on patient units predicted they would be most used in the morning when activity was heavy and physicians were making rounds, and would be less used in the afternoons when two traditional central stations would dominate. The hypothesis was not supported: nurses used decentralized positions on all three shifts. This lesson has led to more effective decentralized designs and a shrinking of the central stations in subsequent projects. Decentralized positions for caregivers is an example of a design concept that is a response to a change in an organizational concept.

Interdependent Relationship Between Culture and Facility Design

An effective facility design must take into account the tasks and systems involved in producing the work of an organization or a subunit of an organization. The facility design process shines a light on the way things are as an organization pauses to consider how to make things better. The design process offers a unique opportunity for an organization to assess its performance and to consider redesign of the work and supporting systems. This design effort can include work process mapping as one way to understand, evaluate, and improve a work environment. Work redesign is a classic organizational intervention (Hackman & Oldham, 1980).

Improving the workplace environment has been targeted as a means to achieve higher caregiver or employee satisfaction (Mroczek, Mikitarian, Vieira, & Rotarius, 2005). According to Huw (2004), "86% of directors of nursing believe that the design and operation of hospital buildings have a significant impact on staff " (p. 16). Noting that more than 90% of nursing chiefs confirm they have problems recruiting staff, Huw further reports that 78% accept that "the design and layout of their hospitals is a major barrier to recruiting nurses" (p. 16).

Consideration of cultural elements during the facility design process can ensure that the new design is aligned with values and the built environment supports organization design systems and structures (Hamilton & Orr, 2006). Furthermore, the facility is itself an artifact and symbol of an organization in the community and to employees. The nature of facilities supports assumptions and expectations such as efficiency, hierarchy, expressions of wealth, or a healing environment.

Culture is both reflected and created in buildings and the buildings and offices of the organization. (Deal & Kennedy, 1982, in Ulrich, 1984, p. 120)

Organizational culture is the context for every built facility, and culture cannot exist without a setting. The stage for human behavior and all of its cultural implications is the physical and built environment. Architecture contains culture, and as Winston Churchill (1943) so famously said, "We shape our buildings; and afterwards our buildings shape us." The interactive nature of culture and the physical environment means that changes in either should prompt evaluation and alignment with the other.

Place conveys messages about an organization's values and culture. The design of the physical environment contains messages for those who experience it. As Berry and Bendapudi (2003) put it, "Healthcare buildings, equipment, furnishings, displays, signs, colors, art, landscape, and other sensory stimuli offer a torrent of clues about the provider organization, and these clues have a disproportionate impact on customers' overall evaluation of the service" (Berry et al., 2004, p. 5).

People respond to their environments (Clark, 2007). Smith and Bugni (2006) suggested "?physical buildings, places, and objects act as agents to shape our thoughts and actions; they invite self-reflection" (p. 124). The physical environment dictates behavior through simple design decisions such as placement of doors and appropriated space (Ellen, 1982).

Because new designs change the environment for interaction, they show old behaviors in a new light and illustrate how new behaviors emerge. (Gaver, 1996, p. 115)

Hatch (1997) conceptually connects physical structure to the formation of corporate image, organizational identity, and territorial boundaries resulting in group identities. For example, it is common in a hospital for employees to identify with the "Fourth Floor," referring to more than the physical location, but also the cultural identifiers of the way things are done on that floor.

Transformational Change

Fundamentally, transformation means irreversible change. According to the American Council of Education, "Transformation (1) alters the culture of the institution by changing select underlying assumptions and institutional behaviors, processes, and products; (2) is deep and pervasive, affecting the whole institution; (3) is intentional; and (4) occurs over time" (Eckel, Hill, & Green, 1998, p. 3). The IOM report, Crossing the Quality Chasm, called for fundamental changes to repair "disjointed and inefficient" systems of healthcare (IOM, 2001). Many healthcare systems have therefore put cultural transformation on their agenda. A study funded by the Robert Wood Johnson Foundation examined the journey of cultural transformation as described by emerging pioneers (Kimball, 2005).

When asked to rank the three most important elements of a successful culture transition process, the critical triumvirate cited by the majority of participants was: 1. Leadership commitment and support, 2. Shared vision and values, 3. Involvement and ownership at all levels. (Kimball, 2005, p. 15)

Transformation requires a major shift in an institution's culture, such as shared understanding, collective assumptions, and thinking, sometimes referred to as the "invisible glue" (Kuh & Whitt, 1988; Schein, 1992). To achieve transformation, organizations must be willing and able to do the hard work of engaging in reflection and learning processes.

Culture change consultants can facilitate discussions that create openings for transformation, but the move to a new way of thinking and doing is complex and unpredictable. There are multiple forces in play as an organization starts to try new ideas. These forces come from beliefs, routines, and relationships with diverse groups (such as patients, vendors, professional organizations, etc.) that have pre-existing expectations of the organization. An effort to permanently move to a new foundation means renegotiating all of these expectations.

To achieve profound or transformational change, both cultural interventions and facility design must take into account and accommodate the desired future state (Hamilton & Orr, 2006). The integration of culture change and facility design processes is not always coordinated, yet they are sometimes paired in transformation projects.

Joint Optimization and Sociotechnical Theory

Eric Trist and Ken Bamforth brought sociotechnical theory into focus in 1951. The concept asserts that social (complex human system) and technical (technology, systems, facilities) elements are inseparable and that interventions in one without the other are disruptive to their intrinsic relationship (Cherns, 1976). Joint optimization of the social and technical components of a work environment is therefore necessary to maximize performance in such complex systems.

Attempts to change the technological and/or social system must be mindful of the relationship between the two systems (Vecchio & Appelbaum, 1995, p. 607 in Appelbaum, 1997).

At Harbor Hospital Center in Baltimore, joint optimization did not take root until senior leadership realized the ineffectiveness of various task forces that were struggling to effect a new model of care while separate task forces were planning to renovate several patient care units. The CEO had committed to an integrated approach that combined a new model of care and the architectural design. The chief nursing officer said, "As we began this transformation process, we knew that we were going to renovate our hospital based on our master facility plan. But we also knew that before we could begin that process, we had to make some changes in our culture. We knew that we could make the place as pretty as we wanted, but if the people did not work in it the way that we wanted them to, it would not mean a thing" (Copeland, Johnson, & Orr, 1997, p. 106). This opened the door for the architect and organizational consultant to facilitate planning focused on the interconnection of physical design and cultural transformation. The coordinated effort led to several outcomes, such as changes in social and political norms, breaking down entrenched subcultures, and increased respect in the community. The fi- nancial state of the organization was turned around, and the hospital became a top performer in the area (Copeland et al., 1997; Hamilton, 2003a).

A cultural shift may be required for successful implementation of an evidence-based change. For example, in a classic study Argote (1982) found "compelling evidence" that particular ways of coordinating patients (a technologically good idea) could improve emergency room care. However, she also found that sharing the evidence did not change the behavior in the emergency room. Similarly, evidence-based design provides useful data that can improve the therapeutic environment; however, if the data are not incorporated into practice and aligned with cultural initiatives, this evidence may be wasted. Sociotechnical concepts suggest that the introduction of new technologies (such as methods of coordination or built environments) must be integrated with the social aspects of an organization to be effective.

A New Model for Joint Optimization

Theory can be useful in guiding the development of models that must be flexible and adaptive as they are tested in practice. Sociotechnical theory suggests that combining culture change initiatives (social) and facility design (technical) can enhance the likelihood of sustained positive change. Joint optimization begins with a shared vision for transformation that guides both cultural and facility-based interventions.

The processes of culture change and architectural design can be unified. Beginning with the assessment, which leads to a common vision and goals, these parallel processes can be combined to create a single coordinated process that optimizes both the social and physical aspects of an organization.

Assess and Evaluate Culture and Facilities

As Jim Collins (2001) puts it, the organization must be brutally honest with itself as it assesses its current state and identifies the gap between existing conditions and the desired future state. If the gap is large enough, transformational change may be appropriate.

Establish Common Goals and Vision

If an organization's leaders feel that transformation is required, they must articulate a shared vision and commit to a path toward the future. They must select a pair of qualified teams to plan and implement cultural and facility changes.

Plan Interventions and Design Concepts

The interventions associated with culture change, including education, training, and cultural awareness, along with new practices for personal and professional relationships, must be planned and coordinated with the facility design process. Likewise, a facility plan must respond to the desired culture change and emphasize the human side of design. Joint planning works to minimize cross-purposing and to maximize reinforcing support between the processes.

Implement Culture Change and Build the Facility

As the interventions and construction project proceed, communication and the language of joint optimization become crucial. Planned coordination at the intersections of the two processes will help align changes in both processes with the shared goals and vision.

Assess and Evaluate Culture and Facilities

Some measurements and data gathering occur before and during the process. When the implementation effort has been completed, measuring progress and sustaining momentum are a priority. An organization can build on its success as the cycle begins again.

In some ways, the concept is remarkably simple: Coordinate two efforts to achieve a shared objective, and take every opportunity to communicate along the way. On the other hand, it requires that two qualified teams with completely different expertise understand each other's tasks well enough to coordinate effectively. The greatest challenge for each team of experts is the ability to see how their separate efforts impact the other, and conversely, how the other team's effort will impact theirs. It is not easy, but it has been done successfully. Transformation work is nonlinear and involves ongoing and simultaneous attention to a range of planning and organizational factors. The following examples illustrate various ways these factors can interact.

Examples of Culture Change Integrated with Facility Change

Although the formal description of the Joint Optimization Model originates with this paper, there are examples of where the principles described have been applied. Transformational examples range from changes associated with individual units (Gilpin, Nelson, & Schweitzer, 1991; Orr, 1989, 1992) to initiatives associated with full-scale hospital change (Reiling, 2005; Reiling et al., 2003). Transformational projects for the Planetree organization, Harbor Hospital in Baltimore, and St. Joseph's of West Bend, Wisconsin, have already been mentioned. Each featured coordinated organizational, cultural, and architectural change. In every case the intended transformation required integrated change initiatives that combined organization change, culture change, and a construction project.

The Center for Health Design (www.healthdesign.org) developed the Pebble Project, in which more than 40 healthcare organizations so far have enrolled to perform research on their innovative design projects. Most are involved in an attempt to implement an evidencebased design process while measuring the outcomes and results related to the design. Many of them are also involved in some form of organizational or culture change.

Comprehensive Cardiac Critical Care Unit, Clarian Methodist Hospital, Indianapolis, IN

One of the earliest Pebble Projects was a renovation that produced an acuity-adaptable design for cardiac patients. Combining critical care and stepdown in a single unit where patients did not need to be transferred required changes in both culture and facility. Results included a more than 90% reduction in transfers, a 70% reduction in medication errors, a reduction in falls to a national benchmark of 2 per 1,000 patient days, and significant financial and operational savings (Hendrich, 2007; Hendrich, Fay, & Sorrells, 2004).

Bronson Methodist Hospital, Kalamazoo, MI

The design effort for a replacement hospital was a full partner in the organizational change process that led to the 2006 Baldrige Award. The design was based in part on evidence that positive distractions for patients and their families, such as art, music, and the influence of nature, play a supportive role in recovery. The project featured all private rooms, and the system's research showed hospital-acquired infections fell 11% (Nelson, 2006) resulting in an annual savings of $1.2 million. Bronson estimates it saves $500,000 a year in patient transfer costs. Other outcomes include 95.7% patient satisfaction (Rollins, 2004) and reduced nurse turnover (Nelson, 2006).

St. Michael Health Center, Texarkana, TX

This replacement hospital supported and revitalized a strong culture of Catholic caring, which became more visible and effective after the new design was implemented. The facility design enabled organizational changes that minimized some departmental silos through the introduction of a single diagnostic center and a single procedure center. Patient units were designed to implement decentralized care giving, which required a change in the physician-nurse culture (Hamilton, 2003a).

United States Air Force

The traditionally hierarchical military healthcare system was challenged to transform its culture when new regulations offered military personnel the choice to select military or nonmilitary healthcare providers. This new policy mandated adjustments to the traditional way service was delivered at military treatment facilities. In 1966 a task force led by top members of the Air Force Surgeon General's office, representatives from every medical treatment facility, and an organizational consultant developed and implemented a system-wide approach to create a more customer-focused climate and culture, including ways to enhance facility design. One result was that the Air Force received the highest patient satisfaction scores of any branch of the military for four consecutive years.

Valley View Medical Center, Cedar City, UT

A hospital was replaced because of obsolescence and the need to upgrade for seismic protection. The degree of organizational change that occurred would have been impossible without facility change. The resulting smalltown hospital featured a newly efficient culture of lean operation and facilities that eliminated departmental boundaries. A marginal operation was transformed into one of the top performers in the Intermountain Health Care system.

St. Joseph Health System, Orange, CA

This system, which operates 14 hospitals, three home health agencies, and multiple physician groups, undertook a project in 2001 to develop and implement a holistic, patient-family centered model of care and enhance their culture of caring and compassion. Nancy Lee, system champion of holistic, patient-centered care and an external consultant, worked with two sites, one acute care and the other ambulatory, designated as "laboratories for learning." Cultural design teams were charged with the responsibility to critique all existing policies, procedures, and systems to ensure that they were aligned with the system's core values and the desired culture. Innovative ideas, programs, and behaviors focused on the desired culture resulted in positive outcomes in patient satisfaction, employee engagement, and a renewed spirit to embrace change. For example, one of the small hospital sites went from the seventyninth to the ninety-sixth percentile in the 2007 Press Ganey rankings. The facilities division adopted design principles to help reinforce and support its holistic, patient-family centered culture. Lessons from the two laboratories are currently being disseminated throughout the system (Orr & Lee, 2007).

Implementing a Joint Optimization Effort

There are theories and methods to help guide the processes of organizational change and architectural projects. However, when the opportunity to coordinate facility design and organizational change presents itself, there are important considerations. To fully leverage evidence-based design and organization change efforts that have the potential to transform a culture, there is an ongoing need to identify opportunities for coordination and action.

Leveraging change initiatives for both the culture and the physical environment begins with their evaluation and alignment with each other. A joint process is an opportunity to bring people together to discuss what they value. Both the culture change process and the facility design benefit from this common understanding and dialog. A shared vision across the initiatives can enable a new level of innovation, because options for coordinated change offer more flexibility and fewer constraints. The processes should honor the commitment and intensity of the participants.

Traditional culture change and facility change processes have their own steps. The two processes work independently within their own areas of influence and relate to each other in the common process of the Joint Optimization Model (Figure 2). The center column graphically illustrates some of the principal intersections and points of coordination of the joint process. These activities bridge the culture and facility change processes.

The Joint Optimization Model must include the implementation of coordinated initiatives if it is to lead to organizational transformation. In a conventional change project, each process has a set of traditional steps that are performed independently. The way they interact and link in an integrated implementation process determines how joint optimization occurs. Sustaining the collaboration between the two processes for the duration of the effort requires constant attention to communication.

Comprehensive Assessment

An organization that intends to transform itself must undertake a serious evaluation of its assets and liabilities. It must examine the tangible and intangible elements that make up its current state. Of course, this includes both culture and facilities.

Cultural Assessment

Transformation endeavors require conducting an honest assessment of an existing culture. It is impossible to chart a path to get from here to there if the starting point is unknown or undefined. Research has shown that executives and leaders may assume they understand their culture, but when honest and direct dialog occurs throughout an organization misperceptions are revealed (Huw, 2004).

Conducting a culture assessment can help create the catalyst for transformational change. One must not resist the imperative to ask candid questions to understand and acknowledge subcultures, politics, and barriers to change. Recognition of an organization's strengths and deficiencies can be experienced as an emotional event. It can trigger a change impulse where previous attempts have failed. It makes the case for change by sending a personal, meaningful, powerful message that is quite distinct from the customary "Get your numbers down!" (Simon, 1998, p. 1). Conducting an assessment can establish a sense of urgency and gain the cooperation needed to move forward (Kotter, 1996).

Facility Assessment

It is equally important to have a full understanding of an organization's facility, equipment, and technology assets. A typical facility assessment survey inventories and evaluates buildings and the campus to ascertain the age and condition of the buildings, compliance with building and life safety codes, the suitability of space for its intended purpose, the status of the engineering infrastructure, and the capacity for future growth, if any.

A facility survey associated with a culture initiative should include an examination of the degree to which the environment supports an organization's mission, vision, and values, along with the current culture and situation. As the description of a desired future state emerges, the design team partners with the culture team in the process to help define a future environment that will support the desired organizational structure and culture.

Benchmarking Tours

Another important aspect of the Joint Optimization Model is to conduct facilitated benchmarking visits to organizations that have designed and built facilities effectively and/or engaged in a cultural change process. Understanding how others have approached a design process and/or organizational change is essential to enhance learning, ignite the flame of possibility, and inspire new ways of thinking.

Observations of culture, the care delivery model, operational patterns, facilities, equipment, and the technology of other organizations can lead to insights about one's own situation. Some of the insights gained on benchmarking tours will be developed as organizational interventions or design concepts within the Joint Optimization Model. Interestingly, it is often observation of things "not to do" that has the strongest impact on the benchmarking participants. Participants representing all levels of the organization should be able to spend meaningful time at the tour location with individuals who have similar roles.

Making the Commitment

An organization may understand the need for change and know how far it has to go to achieve its desired future, but transformation will not occur until behaviors are changed and people actually do things differently. The first thing an organization must be able to say, collectively and with one voice, is "Transforming our culture matters; it's the right thing to do." It requires a public statement from the CEO like planting a stake in the ground, committing to lead (not just support) the transformation work. It must communicate the sense of urgency that is confirmed by the assessment and make the case for change.

> The act of commitment gives meaning to what people are doing. (Block, 2001, p. 81)

Create a Guiding Coalition

Kotter (1996) stresses the importance of beginning any change effort by establishing what he calls the "guiding coalition." It is a small group of people composed of representatives from all levels of the organization who have the credibility and influence to bring others along with them. It is the responsibility of the CEO to support the coalition, giving it authority for its work and communicating its role. It is leadership's role to articulate the vision, eliminate barriers to change, provide the resources to get the work done, and be a voice of encouragement and commitment for the long term.

> Rules, languages, reward systems, and so on do not come out of thin air, nor is it sufficient to say, as some sociologists argue, that such things are enacted and result from the interaction of members. That is true but insufficient. In any group situation, some members will be more active than others and will propose verbally or by example how things "should be." These acts of leadership can come from different members at different times, but they are always there in some form or another. (Schein, 1992, p. 93)

Team Liaisons

Both culture change and facility design teams form working relationships over the life of projects, creating a cross-pollination that can happen only if culture and design teams are linked or merged. This can be one of many opportunities for community-building within an organization, the chance to send a powerful message that the organization values community. The challenge for hospitals seeking cultural transformation and the optimization of design is to engage the entire organization. This process must include efforts to break down barriers between and among departments, services, and subcultures. The Joint Optimization Model ultimately seeks to empower a broad-based coalition of stakeholders grounded in the values of openness, inquiry, and inclusion.

Several of the organizations believed their success took a major leap when lower level staff "bought into" the process and truly understood why it was being done. (Meade, 2005, p. 3)

Figure 3 provides a diagram of an idealized team structure illustrating the chain of decision making up to governance and the board while empowering broadbased involvement at the subteam level. It shows the need for liaison roles to ensure coordination and collaboration.

Culture Design Team

There must be a designated group willing to say "We will champion the changes necessary to create the culture we desire." The culture design team must champion the process and include a range of representative participants as well as expert organizational consultants from inside or outside an organization. There will be a need for the culture design team to work with broadbased subteams that focus on individual initiatives and special tasks. It is the role of the team to develop a vision for cultural transformation based on leadership expectations, assessment of current culture, and the desired future.

Hospitals traditionally have had organizational structures that make it difficult for staff to act collaboratively as a team. Kimball (2005) described hospital structures as "paternalistic, fragmented, independent silos, top-down, top heavy, bureaucratic, multiple layers, hierarchical, like a state bureaucracy, lack of twoway communication, physician centric, clinical model driven by business model" (p. 9).

At Harbor Hospital in Baltimore, staff made a "covenant" as a real and symbolic commitment to one another. It helped ground the organization's transformational journey, providing a deeper level of meaning to staff at all levels. There was a tangible behavioral element constantly visible to the staff as the change process unfolded. It was not a commitment to another new program, but a commitment to one another to embrace, lead, and demonstrate the behaviors required to effect transformational change.

Facility Design Team

A design team to oversee planning for physical change is an obvious requirement. An architectural firm quali- fied in evidence-based design, an experienced facilities director, and appointed leaders from within an organization participate in meetings to help guide design decisions. To gain broad-based participation from organization members and the future users of

the constructed or renovated building, the facility design team should lead a group of subteams or committees to explore the programming of space requirements, key design issues, relevant evidence related to the issues, and the specific design concepts to address them. A unique task in a joint project is the development of hypotheses and concepts that address culture change issues. With an eye to functionality, an organization's users help develop the plans, selecting equipment and furnishings and reviewing the architect's detailed plans.

The facility design team must have a strong liaison with the culture design team. It is the role of the facility design team to collaborate in developing the plan and overcoming the inertia of an organization's natural tendency to maintain the status quo. The first construction phase at Harbor Hospital, for example, was highly successful, yet the subsequent phase was challenged by an influential physician. The design team had to make the effort to confirm the overall transformative direction for change and help the organization stay on track with later projects. In this case it was accomplished by conducting a patient survey in conjunction with the physician to sample his patients' preferences. Once provided with data, his resistance evaporated.

Joint Optimization and Design Team Liaisons

When performing broad-based planning for culture change and participatory planning for facility change, it is cumbersome to attempt to have everyone involved in the same room as often as would be productive. For this reason, the joint optimization process requires attention to the liaison roles between the culture design team and the facility design team. Different organizations will choose different compositions, meeting schedules, and agendas for team liaisons. In many cases, there will be common membership for portions of the two teams. What is most important is the ongoing effective communication between the groups who have taken on the task of planning and integrating the course of change. There will be times when the two teams must meet together as full groups to resolve issues or brainstorm new directions.

Shared Vision

Parallel courses of facility change and culture change may have discipline-specific vision statements; it is, however, the common ground of shared vision and understanding of the desired future that is important. It is the dialog about what is possible, creation of a common language, and the evolving cross-education between the teams that makes the difference. James O'Toole, the Pulitzer Prize-winning author on change, has said, "? to talk about culture as an 'it' is absurd: culture is 'us.' To talk about top management's role in changing corporate culture is to talk about people changing themselves, not changing some 'it' or 'them' outside the doors to the executive suite" (O'Toole, 1996, p. 74). Therefore, the vision must be shared by all affected.

Setting a New Path

One way to describe the role of vision is to say that it points the way along a new path to the desired future state. Here are some questions to explore when seeking common ground and direction for a new path:

* Who are we, and what do we value about our current culture?

* How do we interact with each other and with our community?

* How does our culture support quality care, and how do our traditions and attitudes keep us from providing the best care possible?

* Are we ready, as an organization, to undertake transformational change?

* How can we measure our starting point? How do we identify or quantify where we are now so that we can assess the impact of our efforts to transform our culture?

Once a clear vision of the transformed organization has been articulated, the task is to develop a strategy by means of which the organization can achieve its goals. The strategy must align realistically with the situation offered by the external context and with the organization's new goals. Culture and physical environment are linked elements of the change plan.

Common Communication Plan

Communication is another action that can support or hinder transformation. Cultural transformation and the design of new facilities are rarely simple or linear activities. Stops, starts, ups, downs, detours, and diversions are all part of the process. Communication about gains, achievements, and progress becomes especially important for everyone involved in the effort: leaders, physicians, staff, patients, families, members of the community, and the design teams. Communication simultaneously reflects and influences culture. The champions must model the world in which they want to live. The transparency, frequency, and participatory nature of communication plans must be consistent, reinforcing actions and educating all stakeholders about the desired culture and progress toward it.

Culture is the result of all the daily conversations and negotiations between the members of the organization?If you want to change a culture you have to change all of these conversations. (Seel, 2000, p. 2)

There are more methods of communication today than ever before: meetings, memos, e-mail, voice mail, bulletin boards, the Internet, intranets, newsletters, newspapers, written reports, and so on. Even with all these tools available, one of the most common reasons that transforming an organization's culture fails is communication. John Kotter contends that one of the most common errors is "undercommunicating the vision by a factor of 10 (or 100 or even 1,000)" (Kotter, 1996, p. 9). The plan for change must be communicated to everyone in the organization and to all stakeholders associated with the organization. In addition to a clear, compelling vision, everyone must understand why change is needed.

* What will this change process mean to me?

* What will various departments (subcultures) look like after changes are made?

* How will it be/look different from today?

* How can we tell this story, paint this picture of the future, in a way that will ensure that others will understand it, accept it, and want to be part of it?

There is an opportunity in both internal and external communications to state clearly why new facilities or renovation projects are important to clinical outcomes and more effective work environments, and as a reflection of the organization's values. A communication plan that integrates the key messages of facility design and cultural transformation can paint a unique picture of the significant investment and rationale behind them.

Organizational Interventions and Coordinated Plans

The Joint Optimization Model of cultural transformation and evidence-based design initiatives encompasses all aspects of a healthcare organization. Many of the areas in which cultural transformation is sought (attitudes, inclinations, or perspectives) can be amorphous or intangible. Organizations can use tangible activities, programs, educational initiatives, or training sessions to give substance, vitality, and longevity to their otherwise intangible transformation work (Reller, Orr, & Barrett, 2007).

It is important to note that programs planned or initiated as part of the joint optimization effort are not meant to be temporary or transitory. In fact, true transformation will occur only when programs are integrated into the very fabric of an organization. Here are some of the key questions to ask as this aspect of the process is addressed:

* Are participants in the joint optimization approach supported through education and training?

* Are decisions informed by looking through "the eyes of the patient"? (Gerteis, Edgman-Levitan, & Delbanco, 1993)

* Are we modeling the attributes of a learning organization during the design process?

* Are we looking for opportunities (teachable moments) to reinforce the messages of transformational change both formally and informally? There is nothing more powerful than reinforcing positive behavior "on the spot."

* Have we considered pilots or simulations to determine whether facility design is consistent with the desired future state?

* Are staff and caregivers being educated on the rationale of the new space design to help them understand and learn how to leverage these new assets?

Conducting organization-wide meetings for leadership and staff to learn, share stories, and celebrate victories is essential to keeping a culture alive and vibrant. Dynamic, interactive agendas that include storytelling, celebration, and a bias for action can reinforce the desired vision and values. Meetings at all levels should seek ways to create community through shared experiential learning. Celebrating and learning from shortterm victories is critical to keep the

momentum and energy of the transformational process relevant and to reinforce a sense of urgency.

Finally, consider the character of the meeting place in which education, training, and conversation about design, culture, and transformation occur. Both aspects of organizational transformation require environments that evoke creative thinking. The meeting or gathering place can become a rich resource that holds the data, information, and feelings that frame the space and the interactions. Some organizations have dedicated space to the teams and the participatory process that offers a convenient and effective work location and continuous access to displayed information. Inspiring language, exemplary imagery of the possible, guiding principles for design, suggestions for mutually supportive communication, and visionary thinking can all be helpful.

People Practices and the Human Side of Design

When all is said and done, the truth is that an organization's culture comes from its people: what they believe; how they approach change and care giving; and how they interact with colleagues, patients, and the families they serve. Shortell et al. (1994) named culture as one of the subcomponents of caregiver interactions in intensive care units. They found caregiver interaction to be the "strongest correlate of unit efficiency, evaluated technical quality of care, the ability to meet family member needs, and nursing turnover" (p. 522).

Mroczek et al. (2005) found a relationship between the perception of the physical environment and the well-being of hospital employees. Almost half (43%) of employees surveyed felt that "the increase of natural light from the old building to the new building has a very positive impact on their work life" (pp. 338-339). People who are provided a work environment designed to eliminate stressors and to support the best possible quality of care feel valued. How an organization conducts hiring, orientation, training, and performance management can reinforce the desired culture. Stating the importance of the environment as an agent of healing gives a clear message-intentional or not-about the types of behavior the organization wants. Katie Harrelson, Chief Nurse Executive at Bronson, reports on the impact of their new facility: "In 2005 we had a 5% RN turnover," she says. "Before we opened the new facility, we were at 19% or 20%." Currently, Bronson has a waiting list of nurses who want to work there (Nelson, 2006, p. 27).

Participatory Planning

A particularly effective facility design process for projects associated with culture change is the so-called participatory process, which involves many stakeholders. Successful leaders of transformation understand the importance of listening to all stakeholders in the organization: patients, families, medical and nursing staff, managers, administrators, service line directors, board members, and volunteers. Each of these groups has its own perspective and its own information about "how things work around here," one of the key drivers of culture. "If the aim is to improve the quality of care, or the efficiency of a service, then a culture approach should inquire into what those terms actually mean to participants and how they would assess themselves against those and other definitions" (Scott et al., 2003, p. 942).

Culturally Informed Design

A facility design process that takes elements of the culture into account is likely to produce a different result. The traditional "best practice" architectural model is bound to be altered by the addition of organizational and cultural concepts to the process (Hamilton, 2002).

At the original Planetree unit in San Francisco, designers took into account the philosophy and values of the new care model and thus chose to use wood trim in an uncommon way to symbolize the human touch of noninstitutional craftsmanship (Lindheim & Syme, 1983). As more Planetree projects were developed, designers included family kitchens and library-like resource centers open to patients and their families on patient units (Frampton et al., 2003; Gilpin et al., 1991). Architects working with Planetree personally experienced the cultural shift as they worked. They were required to spend the night in the hospital to develop empathy for the patient experience, and they were required to draw images of the patient room from the point of view of the patient in bed.

At St. Michael in Texarkana the expression of the Catholic culture of caring required the architect to include multiple decentralized spaces for meditation and prayer on every floor, along with outdoor meditation gardens, in addition to a traditional chapel. At St. Joseph's in West Bend, the design team interacted with the culture of safety initiatives and produced an innovative design that located the patient bathroom on the same wall as the head of the bed (Reiling et al., 2003). This uncommon design was an attempt to address the safety issue of patient falls by providing a continuous handrail from the bed to the toilet. In the absence of parallel culture initiatives, each of these designs would have been very different.

Architecturally Informed Cultural Interventions

In a similar way, the development of organizational and cultural interventions can be informed by the facility design perspective. The culture change team can be in- fluenced by seeing their current facilities and others on benchmarking tours through the eyes of architects. It is possible for the culture team to describe a desired state absent in the existing setting, and for the facility design team to produce a concrete response that contributes to achieving the desired state. Architectural design can facilitate the desired activity and behavior of the proposed future state. It can also rule out undesirable activity and behavior.

When the culture and facility design teams are performing at their collaborative peak, it becomes hard to tell which initiated an idea. The synergy of the joint effort leads both to feel pride of ownership and a sense of complete involvement in the development of solutions for organizational and cultural initiatives as well as architectural design.

Scheduled Implementation

Once action plans for culture change and facility change are in place, coordinated implementation must be carefully scheduled and launched. Although each initiative must be planned individually, there must be a commitment to a synchronized schedule.

A liaison team must ensure that real-time decisions are timely and consistent. Securing accommodations for families during a renovation or ensuring that patient education materials are available during construction are examples of things that are not normally part of a construction project; yet they may be critical components of cultural transformation. Both cultural initiatives and the physical structure must be designed and executed with care.

Cross-Informed Evaluation

The ability to measure change will serve to consolidate gains and build capacity for continuing change (Kotter, 1996). Organizations seeking transformation must develop the habit of evaluation and re-evaluation. A continuous cycle (rather than a linear sequence) will provide ongoing checks and balances of design and values and encourage a routine of noticing and talking about their interdependencies.

Measuring Progress

Measurement of progress during the cultural transformation process is both essential and difficult. Although some have said, "You can't improve what you can't measure," the renowned physicist Albert Einstein is supposed to have said: "Everything that we can measure counts, but not everything that counts can be measured" (Nasraway, 2007). Many aspects of cultural transformation appear to be difficult to quantify. For example, a change in language is an important indicator of new ways of thinking, acting, and communicating, but it is difficult to measure with the standardized survey tools used in most healthcare organizations.

Consider using forums for dialog to build on what is working, eliminate barriers, and create a sense of community for cultural transformation work.

* Listen to how people describe their experiences in the workplace.

* Create structured time dedicated to capturing their stories.

* Listen to their metaphors, and

* Hear how employees are talking about themselves and patients.

A new building will challenge behaviors and interrupt routines. This adjustment will mean people need to talk about their feelings and explore them at a new level. Consider these questions:

* Are we leveraging the intended purposes of our new place?

* Are we making it something that works for us, as patients and families?

* Do people go home at the end of the day feeling like part of a community?

* Did we keep the part of our culture that is core to who we are?

* Did we let go of the cultural barriers that were not helpful?

The evidence-based design process requires measurement to confirm design hypotheses. It is important for an organization to consider partnering with an architectural firm or research team to conduct a post-occupancy evaluation of the effectiveness of the design on measures established during the planning process.

Feedback and Lessons Learned

To effectively strategize, plan, and adjust, an organization needs feedback on whether the difficult work of transformation is having an effect. One traditional way to do this is to conduct a climate survey that seeks employee perceptions of environmental and cultural aspects of the environment. In the joint optimization approach, listening tours, focus groups, mystery shoppers' feedback, and seeing through the eyes of the patient are other effective ways to make data come alive and take on meaning. Storytelling is another effective way to reinforce behavior, and it should include dialog to emphasize lessons learned.

Building on Success

Sustaining the momentum and progress of a cultural transformation process is difficult yet critical. Human nature makes sustaining change difficult. People get excited and want to participate when something is new and receiving a lot of attention, but that excitement may be lost over time. Kotter (1996) refers to this phase as "making it stick." Without reinforcement the pressures of daily work life push people back into comfortable behaviors unless new ways of working, designing, and implementing projects become the most comfortable behaviors.

Because the environment doesn't stand still and the needs of stakeholders aren't static, the idea is to institutionalize a process of continuing change. (O'Toole, 1996, p. 75)

Planning to sustain change in any organization is essential, but transforming a culture requires a unique set of actions. The following actions are recommended:

* Make sure policies, procedures, and systems are aligned with the vision of the culture you are striving to create.

* Align strategy with culture, organization design, and facility design, and vice versa.

* Make sure changes have sufficient funding, so they will survive.

* Celebrate, reward, and reinforce the value of changes made.

* Ensure that programs and ideas have more than one champion, so support is well distributed in the organization.

* Make storytelling that reinforces desired behaviors a part of every meeting, memo, and publication.

* Proactively maintain the facilities that are the stage for an organization's behavior, constantly sending clues about the organization to all observers.

Some outstanding examples of sustaining the culture can be seen in nonhealthcare organizations. Southwest Airlines, for example, has instituted system-wide culture committees that report directly to the CEO to ensure continual renewal of their culture. Committee members are "keepers of the flame" responsible for brainstorming ideas to maintain and strengthen the Southwest Airlines culture (O'Reilly & Pfeffer, 2000). Healthcare organizations need their own keepers of the flame.

Conclusion

The process of culture change and the planned interventions that stimulate the transition to a new state are conventional methods in organizational consulting. The design and construction processes have equally conventional approaches. The Joint Optimization Model offers the possibility of unconventional and transformational change. To take advantage of the power and leverage available from the synergy between these two processes, they must be coordinated, integrated, and intentionally planned to be consistent with and to support each other.

The intersections of culture change and facility change are many, ranging from a sense of urgency about the need for change and the shared vision of a better state to the coordinated implementation and evaluation processes. The concept of joint optimization comes from sociotechnical theory, and it leads directly to the hypothesis that a Joint Optimization Model that deliberately coordinates social and technical changes in an organization has the potential to produce profound and sustained change.

A potential drawback of joint optimization is the time and commitment required. It is all too easy to lose momentum and for the process to drain the energy of those involved. It is, however, a necessary investment for an organization to earn the important transformative return, because organizational transformation is not likely to occur in a one-dimensional change effort. Problems occur when the two branches of the effort are not aligned; that is, when either culture change or facility design becomes dominant and the "joint" aspect is lost to an effort that overemphasizes one or the other. The potential harm of a failed effort must be weighed before an organization commits to the transformational path.

The conceptual Joint Optimization Model described is empirically sound and has been successfully implemented multiple times in different settings and under different circumstances. Yet this is not work to be taken lightly. These few examples do not guarantee that the model will work in every case. It requires one or more strong champions. For a risk-taking leader willing to be a hard-working pioneer, the potential rewards are immense for the both individual and the organization. The transformational process requires total commitment, discipline, preparation for setbacks, and patience. If the pursuit is successful, the reward is a totally transformed organization that demonstrates and sustains the shared vision that the guiding coalition and the organization's many stakeholders intended.

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