Realizing Benefits from Clinical Systems Implementations:
Dell Perspective, Methodology, Approach, and Results
## Table of Contents

The Dell Healthcare Transformation Perspective ........................................... 3

A Continuous Measurable Process ............................................................... 3

The *Drive to Quality* .............................................................................. 5

Examples of Client Results ....................................................................... 5

Benefits Realization Measurement .............................................................. 6
The Dell Healthcare Transformation Perspective

Dell Services has been involved in many clinical information deployment and support initiatives across all of the major technology vendors and suppliers. We are focusing on empowering our customers to transform their delivery of healthcare services. We have built a diverse group of more than 200 clinicians from multiple disciplines and a strategic group of physicians.

These clinical solutions experts have worked with various teaching, for-profit, and not-for-profit healthcare facilities throughout the U.S. to complete 52 advanced clinical implementations with 11 major platform vendors. This equates to more than 50 different modules. Internationally, we have also completed 48 clinically related projects. We are also in the midst of providing management assistance on the completion of a three-year Cerner Millennium implementation across a number of hospitals in the Gulf Region.

Most recently, we are honored to be recognized by KLAS as the #1 clinical implementation provider among all Professional Service Firms (PSF)/vendors in the industry. Additionally, Dell was the only PSF who had all detail performance scores rank above the industry average, including clinical knowledge, application knowledge, knowledge transfer, and implementing workflow design. KLAS divides workflow redesign into three categories — simple, moderate, and complex. The majority of our customers surveyed (75 percent) said the work we performed for them was complex. This rating was higher than any other PSF in this area.

Dell is not only working with customers to successfully implement technology in their care environments, but is also striving to incorporate clinician adoption and benefits realization into these initiatives to ensure measurable success. For example, the early benefits of adding this performance improvement and tracking capability is the ability for nurses to perform 100 percent chart audits on admission and shift assessments. This capability and focus allows for improved care planning, reduced potential for omission of critical assessment information about the patient, and dramatically improved compliance.

Clinician adoption rates have been very high for hospitals in which Dell Services has been involved in the implementation process. As an example, we were involved in two of our largest health system customers’ clinical adoption processes, and the results ranged from 75 to 85 percent, among the highest in the country. This is in comparison to the single digit adoption rates we have seen at sites where we have not been involved.

Our perspective has developed as a result of that experience, which has seen a shift in the historical focus on the technical aspects of deployment to the current emphasis on adoption and value. In our view, healthcare transformation requires a fundamental and interconnected change in the structure and function of healthcare systems that will transform the characteristics of healthcare, resulting in optimized health and quality of life for all patient populations and added value for all stakeholders.

A Continuous Measurable Process

We look at healthcare transformation as a continuous process that provides real measurable value, but poses significant challenges. First, transformation requires a substantial investment of time, talent, and financial resources to be successful. Clinical systems and the needed hardware and infrastructure are expensive and require expertise for successful deployment and for the ongoing maintenance and updates that are necessary for continued benefits.

Second, a successful transformation effort needs to have precisely aligned critical success factors. The strategic drivers for the business and the stakeholders need to be well understood and the drivers for sustainability of the continuous process of improvement required for transformation need to be articulated. Success requires an unwavering focus on the structures and functions to be transformed with a clearly defined methodology, roadmap, and accountability for making the change happen. It is imperative that success is described in terms of value measures that are defined and validated.

Third, the continuous process of transformation is challenging to execute: the healthcare environment is dynamic, with changing regulatory requirements, practice variations, and reimbursement standards at the same time that there are entrenched practices and practitioners within organizations that are reluctant to change.
Realizing Benefits from Clinical Systems Implementations

The continuous process of transformation, or the transformation cycle, is comprised then of three key elements:

- Strategy
- Methodology
- Measurement

Strategy drives transformation efforts by creating a vision of the future and synergies among people, process, and technology to achieve the vision. The execution of repeatable methodologies, i.e., the Dell ADOPTS methodology discussed below, provides the roadmap for implementation of the change efforts (technical and non-technical). Measurement is the final part of the cycle and provides the means to assess the results, optimize outcomes, and ensure sustainability.

We recognize that successful healthcare transformation initiatives are built on a foundation of work involving more than simply technology deployment. At its core, we believe the effective deployment of a clinical information system is not a technology issue, per se. Rather, our experience suggests that healthcare organizations too frequently do not focus sufficient time and energy on the people and process issues related to effective CIS deployment.

The successful deployment of any CIS requires a concurrent focus on all three dimensions — people and process in addition to technology. Such a focus mitigates risk and fosters success in the adoption of systems, which represent the foundation for healthcare transformation. Such an approach will realize greater value for the organization through a balance of judicious deployment of new technology coupled with attention to modifications in the flow of work, organizational change dynamics, and how knowledge is used in the organization.

To facilitate an effective focus on the three critical components of healthcare transformation, Dell Services has developed a practical, experienced model for the effective implementation of clinical information systems. Once the initial project set up and organization is completed, Dell will use its “ADOPTS” framework, which allows the client to assess, design, optimize, prepare, transform and sustain clinical information systems. While we use this approach as a framework, we also recognize that each organization holds unique characteristics; thus, we tailor the methodology to meet specific needs as part of the project setup and organization. Briefly, the model includes the following components:

- **Assess** — Define the environment and enterprise clinical and business needs in response to a problem or change.
- **Design** — Design the ideal solution and determine how the market or clinical environment can support the clinical and business needs of the enterprise.
- **Optimize** — Ensure the effective solution design and change strategy that can best meet clinical and business needs.
- **Prepare** — Positioning the organization for the successful deployment of the solution as demonstrated by benefits realization.
- **Transform** — Initiating the change that enables the realization of benefits.
- **Sustain** — Establishing and anchoring the change that enables the ongoing realization of benefits.
Some of the key principles related to this methodology are:

• This is a 'vendor neutral' methodology and approach, one that we apply and tailor to the specific nuances of each clinical information system. Although our approach is vendor neutral, we staff projects with resources experienced with the CIS selected by the customer’s organization.

• We tailor this methodology based on what we learn from our initial discussions and work with our customers; in other words, it is not a 'one size fits all' approach.

• This methodology may be applied to any episode along the continuum of care for provider organizations planning to undertake a healthcare transformation initiative, for example, the ambulatory setting, an emergency department, acute care hospitals and health systems, and/or post acute care organizations.

The Drive to Quality
Dell believes the purpose of healthcare transformation efforts should be to achieve real and lasting improvements in the quality of healthcare provided by care delivery organizations to patients. We call this focus the Drive to Quality. By our definition, healthcare transformation is a comprehensive ongoing approach to care delivery excellence that delivers value by measurably improving quality, enhancing service, and reducing costs through the effective alignment of people, process, and technology. Proving the value of healthcare transformation efforts with hard data is the challenge of the measurement component and should be an integral part of the process.

• First, a framework for understanding and describing quality in measurable terms becomes a critical first step. The six aims articulated by the Institute of Medicine in Crossing the Quality Chasm is a good example of this.

• Second, a set of high-level measures to gauge the impact of transformation efforts at the system-level becomes important to detect the effect of changes in one area of the enterprise on others. The Whole Systems measures defined by the Institute for Healthcare Improvement are a fine example of this.

• Third, desired performance levels for all affected patient care processes should be clearly articulated at the onset of any clinical systems implementation project. The set of measures associated with these patient care processes becomes the scoreboard for determining success of the overall effort. The measure set should be balanced and reflect the key quality characteristics desired from those processes. The SCORE framework within the ADOPTS methodology serves this purpose.

These approaches support a benefits realization perspective during a clinical systems implementation effort, as well as an informatics and quality improvement perspective moving forward. Following are a few client examples demonstrating the success of this model.

Examples of Client Results
Case Study: Bay Area (Calif.) Healthcare System — Three Major Hospitals
In January and December of 2006 and July of 2007, three Bay Area hospitals respectively went live with the Cerner Millennium health IT platform. Computerized Provider/Physician Order Entry (CPOE) was included in the overall project. The three hospitals are owned and operated by a California-based healthcare system. Perot Systems, now part of Dell Services, provided healthcare transformation consulting.
Realizing Benefits from Clinical Systems Implementations

The cumulative savings (rounded) from the clinical systems deployment include:

- $7.6 million from improved documentation that has resulted in more appropriate coding and case mix index calculations
- $1.3 million from reductions in patient length of stay beyond the Medicare geometric mean
- $676,000 from improved patient flow management, which has increased emergency department capacity
- $282,000 from a reduction in payment denials for medical necessity due to improved documentation
- $96,000 from a reduction in paper forms
- $46,000 from a reduction in emergency department “Left Without Being Seen” rates

Case Study: Arizona-Based Healthcare System

Concluding in October 2008, Perot Systems, now part of Dell Services, transformation consultants helped an Arizona-based healthcare system realize benefits of clinical information systems through a project to improve pharmacy documentation using a rule-enhanced version of clinical documentation.

Key outcomes realized by that effort include:

- A 30% increase in the quantity of pharmacist interventions
- An increase in the quantity of types of interventions completed from 4 to 22
- A 25% increase in the time spent on medication monitoring

Benefits Realization Measurement

The ADOPTS methodology and associated toolkits are designed to promote user adoption and include an emphasis on communication, change management, and multi-disciplinary user involvement to achieve adoption. We are committed to measuring value and, as detailed in the embedded figure, we have developed a panel of indicators (SCORE) to reflect the benefits that may be obtained in healthcare transformation.

One of the six domains, clinician participation and adoption, is focused specifically on physicians and prescribing providers. Our work in this domain is integrated with all of the other domains, and thus, considers and develops governance and leadership, process redesign, change management, benefits realization and technology implementation strategies that are targeted to physicians and physician adoption of technology.

The unique characteristics of ADOPTS, including the comprehensive nature of the six domains and the effectiveness of an approach that integrates the work in each domain, have provided the most benefit to our customers. Utilizing physician consultants in our approach, we are committed to benefits realization and success metrics, which distinguishes our methodology and contributes significantly to our customers’ success. Physicians respond positively to data and demonstrable results, which is a key element in our approach.
## Benefits Realization

<table>
<thead>
<tr>
<th>Safety / Quality</th>
<th>Clinical Adoption</th>
<th>Operational Efficiency</th>
<th>Return on Investment</th>
<th>Evidence-based Decision Making</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Medication errors by type</td>
<td>• User satisfaction</td>
<td>• Emergency Department Left Without Being Seen (LWBS)</td>
<td>• Denials</td>
<td>• Use of evidence-based order sets</td>
</tr>
<tr>
<td>• Adverse drug event rate</td>
<td>• End-user login percent by discipline</td>
<td>• Throughout Emergency Department (time from door to admit/discharge)</td>
<td>• Discharged Not Final Billed (DNFB)</td>
<td>• Use of alert overrides</td>
</tr>
<tr>
<td>• CMS compliance score</td>
<td>• Remote access utilization to patient-related information</td>
<td>• Missed transfers (bed availability)</td>
<td>• LOS and cost for top 25 DRGs by payer source</td>
<td>• Use of acceptance reminders</td>
</tr>
<tr>
<td>• The Joint Commission/ National Patient Safety Goods compliance scores (e.g., Fallas, SSI, med reconciliation rate)</td>
<td>• Help desk calls by reason for call</td>
<td>• Coding Compliance (CMI Appropriateness)</td>
<td>• Overall pharmacy cost per case mix adjusted discharged</td>
<td>• Use of knowledge resource links</td>
</tr>
<tr>
<td>• Reduced mortality and morbidity</td>
<td>• CPOE utilization rate</td>
<td>• Worked hours per unit of service by department</td>
<td>• Operating Expense/Adjusted Discharge</td>
<td>• Use of clinical pathways</td>
</tr>
<tr>
<td>• Completion of screening assessments (e.g., vaccinations)</td>
<td>• Ordering provider electronic signature timeliness</td>
<td>• Duplicate tests (Lab/Rad) by cancelation reasons</td>
<td>• Recruitment cost avoidance</td>
<td>• Use of patient risk assessment tools</td>
</tr>
<tr>
<td>• Patient education/discharge teaching compliance</td>
<td>• Clinical documentation completion rate</td>
<td>• Medical Records deficiency rate</td>
<td>• Adverse Drug Events/1,000 patient days</td>
<td></td>
</tr>
</tbody>
</table>