Electronic Records / Clinical Information Systems (CIS) and Global Markets

November 2014
What is a Clinical Information System (CIS)?

A Clinical Information System supports the integrated delivery and documentation of healthcare services provided across the patient lifecycle.

**In Hospital**

A CIS is typically comprised of an electronic “chart” that stores clinician documentation and acute care information captures by integrated departmental modules.

- Radiology
- Scheduling
- Patient Access
- Surgery
- Lab
- Pharmacy
- Health Info. Mgmt.
- Billing/Charges
- Specialty (Cardiology, OB/GYN, Oncology, etc.)
- Clinical Documentation (Orders/Results)

**Outside Hospital**

Many CIS solutions integrate to ambulatory care records, and, increasingly, can manage data flow to health information exchange networks and mobile monitoring solutions.

- Ambulatory Care
- Health Info. Exchange
- Mobile

**Business Office**

Charges produced through clinical services are integrated to the organization’s financial management systems.

- Claims Engine
- Financial Mgmt.
- General Ledger
- Revenue Mgmt.
- Pt. Financial Services
Clinically, acute care is more complicated than ambulatory care. The revenue cycle remains similarly complex in both settings. International clients will often not require the functionality of the revenue cycle in the back-end processing.
## Why CIS: Market Drivers apply to Global Markets

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<tr>
<th>Goals/Drivers</th>
<th>Current Situation</th>
<th>New Frontier</th>
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| Enhance Clinical Quality and Patient Safety | - Limited use of Enterprise Health Systems  
- Patients concerned about confidentiality and price  
- Incidents of preventable deaths | - Requiring the use of clinical information systems  
- Implementing cohesive legislation  
- Developing preventable measures to fatal mistakes |
| Improve Operational Performance / Decision Making | - Paper documentation methods  
- No uniform system of reporting  
- Minimal universal safety check techniques | - Electronic medical records  
- Handheld devices for collecting and reviewing data  
- Decision tools and support programs |
| Provide for Interoperability Data | - Weak communication among health clinicians  
- Data misinterpretations across providers  
- No uniform way of storing health records | - Standardization of medical terminology  
- Clinical data repositories  
- Uniform methods of managing IT |
| Retain & Attract Clinical Personnel | - Providers developing favorable/unfavorable reputations  
- There is a “war” on attracting and retaining the best resources | - Reward programs for quality providers  
- A “tool” to help win the war for talent |
| Sharing Patient Data Across County Health Systems | - Few healthcare organizations have the ability to share patient data across health system | - Healthcare organizations are participating in Health Information Exchanges (HIEs) to share patient data between health systems |
Key Trends in the CIS Global Market

1. More sophisticated systems
2. Replacement of Legacy Systems
3. Content /Workflow Tools
4. System Flexibility
5. Data Share
6. Turn-key Installs
7. Value-based delivery
8. Community Model of “Interoperability”
9. Bundling/Focus on Specialties Modules
10. Ambulatory Strategy
11. Device Integration
12. Reporting / Predictive Analytics
13. M&A Activity
14. Regulatory Requirements
Key Vendors in the US Market moving to Global

CIS Vendor Market Share

Ranked Top 10 Across Inpatient & Ambulatory Services:

Inpatient Vendors
- Cerner: 24%
- Meditech: 14%
- All Others: 15%
- Epic: 13%
- Allscripts: 10%
- HCA: 9%
- CPSI: 6%
- Healthland: 3%
- Iatic Systems: 2%
- Siemens: 2%

Ambulatory Vendors
- Epic: 22%
- Allscripts: 12%
- eClinicalWorks: 8%
- GE Healthcare: 6%
- NextGen: 5%
- Greenway: 3%
- athenahealth: 3%
- Practice Fusion: 2%
- Cerner: 2%
- Medent: 2%
- All Others: 34%

Cerner
Epic
Allscripts
Typical Phases of an CIS Implementation are consistent across countries

<table>
<thead>
<tr>
<th>Vision</th>
<th>Plan</th>
<th>Design</th>
<th>Build</th>
<th>Deliver</th>
<th>Operate</th>
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<tbody>
<tr>
<td>Establish the overall people, process and technology visions for an CIS implementation</td>
<td>Complete the business case, including a TCO model as needed</td>
<td>Document business processes in IndustryPrint and track fit/gap of all requirements</td>
<td>Configure the software based on the design, perform the testing of the system as defined in the Test Management Plan and test approaches</td>
<td>Prepare for and execute system and business cutover to the new EHR solution, which includes conducting user-acceptance testing, performing end-user training, conducting go/no-go evaluations</td>
<td>Transition from the readiness activities of a pre-production environment to actual business operations, and production monitoring and support activities</td>
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<td>Assess the client’s position on the Maturity Model when in scope</td>
<td>Determine clinical and programmatic governance</td>
<td>Plan and Conduct Future State Process and Technical Design Sessions</td>
<td>Complete integrated testing</td>
<td>Establish the support organization to help the client after cutover</td>
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<td>Define high level scope of integrated applications</td>
<td>Document business requirements, primarily through answers to operational level Key Questions</td>
<td>Downtime processes designed</td>
<td>Create cutover strategy and plan</td>
<td>Conduct training and pre-activation adoption and readiness activities</td>
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<tr>
<td>Conduct As One / leadership visioning and alignment sessions and stakeholder analysis</td>
<td>Plan the project by developing the Project Charter, Master Project Plan and more detailed phase specific work plans</td>
<td>End-User Devices Selected</td>
<td>Develop end-user training materials</td>
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<td>Set up PMO processes and tools</td>
<td>Plan and conduct future-state workflow change impact sessions</td>
<td>Develop and Deploy Operational Readiness and Preparedness</td>
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<td>Define System change control processes</td>
<td>Assess stakeholder populations, communication channels and incentive options</td>
<td>Deploy nursing, physician and ancillary change networks</td>
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<td>Develop learning and engagement strategies</td>
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Project Management, Quality Management and Value are phase independent.
Global considerations

• Differences between developed, developing, and third world countries
  – Standard protocols for evidence-based medicine will differ
  – Access to expensive equipment and pharmaceuticals will be different

• Financial component of CIS will differ considerably country to country

• Vendors will drive process change
  – Vendors will change their software to accommodate local country-specific processes in some cases

• Knowledge workers from US are needed in other countries

• EMR vendors concerned about Intellectual Property, other country-specific dynamics

• Significant government funding brings some challenges

• Lack of healthcare IT standards
  – Some standards are being adopted (HL7)

• Cost of CIS systems will become more affordable within countries
Challenges of IT Implementations within Healthcare across countries

Lessons Learned – The Challenge of IT Implementations within a Health Care Setting

Leadership goal alignment 82%
Stakeholder resistance 72%
Unrealistic expectations 65%
Poor project management 54%
Business case not compelling 46%
Project team lacked skills 44%
Scope expansion uncertainty 44%
No organizational change plan 43%
Silos/No horizontal process view 41%
IT perspective not integrated 36%

Change Leadership issues are noted in blue
Source: Deloitte CIO Survey