UCDHS IT Status

UC Information Technology Leadership Council

February 27, 2014
‘Improving lives and transforming health care’

- **Clinical Care**
  - Leapfrog Hospital Group Top Hospital award - 2013

- **Research**
  - $200+ million in annual funding
  - 34th ranking NIH research funding
    (ranked 62nd in 2001)

- **Education**
  - SOM ranked 24th for primary care
    - Ranked 42nd for research
  - Betty Irene Moore School of Nursing
Integrated IT team that serves all of the organizational missions
   − Clinical care, research, education, and community engagement

Operational budget - $99 million / year

Capital budget - $12 million / year and up to $42 million for major projects and technology in new buildings

IT Staffing - 440 FTE

New leader of UC Davis Health System
   − Julie A. Freischlag, M.D.
   − Vice Chancellor for Human Health Sciences and Dean of the School of Medicine
## IT Project Summary

### IT Project Category

<table>
<thead>
<tr>
<th>Category</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY14</th>
<th>FY15-16</th>
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<tbody>
<tr>
<td>Applications (includes Clinical Applications)</td>
<td>6</td>
<td>14</td>
<td>55</td>
<td>54</td>
<td>57</td>
<td>61</td>
<td>22</td>
<td>54</td>
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<tr>
<td>Business Operations</td>
<td>NA</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clients and Printers (combined into IT Infrastructure for FY12)</td>
<td>NA</td>
<td>7</td>
<td>1</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>Customer Service</td>
<td>1</td>
<td>NA</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>7</td>
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<tr>
<td>Development</td>
<td>NA</td>
<td>NA</td>
<td>1</td>
<td>11</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>3</td>
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<td>Educational Technology</td>
<td>NA</td>
<td>3</td>
<td>2</td>
<td>13</td>
<td>3</td>
<td>7</td>
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<td>Facilities Technology</td>
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<td>11</td>
<td>13</td>
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<tr>
<td>IT Infrastructure Technology</td>
<td>18</td>
<td>8</td>
<td>4</td>
<td>11</td>
<td>26</td>
<td>27</td>
<td>16</td>
<td>26</td>
<td>4</td>
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<tr>
<td>Research Technology</td>
<td>NA</td>
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<td>6</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Clinical Registries</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>7</td>
<td>8</td>
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<td>8</td>
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<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Community Partnerships</td>
<td>NA</td>
<td>NA</td>
<td>6</td>
<td>16</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Unified Communications (On Deck in FY13)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
<td><strong>55</strong></td>
<td><strong>92</strong></td>
<td><strong>138</strong></td>
<td><strong>152</strong></td>
<td><strong>148</strong></td>
<td><strong>60</strong></td>
<td><strong>122</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

### Completed vs In Progress

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Completed</th>
<th>In Progress</th>
<th>Budgeted Projects</th>
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</thead>
<tbody>
<tr>
<td>FY14 Q1</td>
<td>32</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>FY14 Q2</td>
<td>18</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>FY14 Q3</td>
<td>33</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>FY14 Q4</td>
<td>33</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>FY15 Go Live</td>
<td>27</td>
<td>27</td>
<td>60</td>
</tr>
<tr>
<td>TBD</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>199</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FY14 Quarterly Project Breakdown

- **Total completed projects:** 199

### IT Key Projects

**FY08 - FY14**

- **Total completed projects:**
  - FY08: 5
  - FY09: 14
  - FY10: 55
  - FY11: 54
  - FY12: 57
  - FY13: 61
  - FY14: 22

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**UCDAVIS HEALTH SYSTEM**
Most of IT Staff now Located at Cannery Building

Alhambra and Stockton
IT Infrastructure Summary

- **Computing**
  - 1,290 servers
  - 11,587 client computers
  - 910 computers on mobile carts
  - 620 mobile computers for BCMA
  - 4,227 network attached printers

- **Networking and communications**
  - 45,000 IP network nodes
  - 10 Gb links to CENIC, Internet, and Internet2
  - 12,475 voice hand sets
  - 4,195 Vocera VoIP communication badges
  - 4,105 pagers

- **Primary and secondary data centers**
IT Service

- Dedicated Technology Operations Center established in May 2008
  - Open 24 x 7 x 365
  - 4 Tier Service model

- Full customer service metrics

- Fully deployed HP OpenView based on ITIL
  - Service manager, change management, asset manager, CMDB, probes and monitors
  - 3,450+ custom IT service guidelines to drive service response
Real time access to all application data
- Hardware layout
- Backup status
- Contract and maintenance
- Usage
- Other...
## Encryption Dashboard

**February 26, 2014**

### Data at Rest - Storage

<table>
<thead>
<tr>
<th>Dashboard Created?</th>
<th>Technology Description</th>
<th>Number of technologies to encrypt</th>
<th>Number of technologies encrypted</th>
<th>Encryption Status Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Enterprise storage - Storage Area Network (SAN) <strong>total storage in terabytes</strong></td>
<td>862.83</td>
<td>177.59</td>
<td>20.6%</td>
</tr>
<tr>
<td>Yes</td>
<td>Enterprise storage - Storage Area Network (SAN) subset of total containing PHI/PII</td>
<td>341.35</td>
<td>177.59</td>
<td>52.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>Enterprise storage - Network Attached Storage (NAS) <strong>total storage in terabytes</strong></td>
<td>812</td>
<td>221</td>
<td>27.2%</td>
</tr>
<tr>
<td>Yes</td>
<td>Enterprise storage - Network Attached Storage (NAS) containing PHI/PII¹</td>
<td>364</td>
<td>221</td>
<td>60.7%</td>
</tr>
<tr>
<td>Yes</td>
<td>Client storage - Encryptable Laptop and Desktop computers</td>
<td>11,587</td>
<td>11,509</td>
<td>99.3%</td>
</tr>
<tr>
<td>Yes</td>
<td>Client storage - Non Encryptable/Secured Laptop and Desktop computers</td>
<td>161</td>
<td>127</td>
<td>78.9%</td>
</tr>
<tr>
<td>Yes</td>
<td>Mobile storage - Blackberry, iPhone, iPad, iPod Touch²</td>
<td>1,404</td>
<td>1,404</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Data at Rest - Media

<table>
<thead>
<tr>
<th>Dashboard Created?</th>
<th>Technology Description</th>
<th>Number of technologies to encrypt</th>
<th>Number of technologies encrypted</th>
<th>Encryption Status Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Back up media - Production applications</td>
<td>482</td>
<td>481</td>
<td>99.8%</td>
</tr>
<tr>
<td>Yes</td>
<td>Back up media - Test/Dev/Training applications</td>
<td>111</td>
<td>111</td>
<td>100%</td>
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</tbody>
</table>

### Data in Motion

<table>
<thead>
<tr>
<th>Dashboard Created?</th>
<th>Technology Description</th>
<th>Number of technologies to encrypt</th>
<th>Number of technologies encrypted</th>
<th>Encryption Status Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Pager messages - Encrypted pages/messages sent and received</td>
<td>4,499,352</td>
<td>4,499,352</td>
<td>100.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>Interfaces engines - Ensemble, Siemens, etc.</td>
<td>184</td>
<td>18</td>
<td>9.8%</td>
</tr>
<tr>
<td>Yes</td>
<td>Mobile transmission - Blackberry, iPhone, iPad, iPod³</td>
<td>1,404</td>
<td>1,404</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - CareEverywhere\Elsewhere (CCD)</td>
<td>24,814</td>
<td>24,814</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - AllScripts - patient discharge summary</td>
<td>30,984</td>
<td>30,984</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - Surescripts - ePrescriptions</td>
<td>5,158,722</td>
<td>5,158,722</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - Surescripts - ePrescriptions (Minus faxed, handwritten and interna)</td>
<td>5,158,722</td>
<td>3,377,372</td>
<td>65.5%</td>
</tr>
<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - PACsGear - clinical images exported to EHR</td>
<td>25,406</td>
<td>25,406</td>
<td>100%</td>
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<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - Physician Connect - unique patients linked out</td>
<td>281,840</td>
<td>281,840</td>
<td>100%</td>
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<tr>
<td>Yes</td>
<td>Health Information Exchange (HIE) - eHealth Global - clinical images scanned from paper and loaded to EHR</td>
<td>26,093</td>
<td>26,093</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Electronic messages - MyChart - patients accessing EHR</td>
<td>87,936</td>
<td>87,936</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Electronic messages - Secure Email - encrypted email messages</td>
<td>118,848</td>
<td>118,848</td>
<td>100%</td>
</tr>
<tr>
<td>Yes</td>
<td>Secure thumb drives - IronKey thumb drives secure PHI/PII in transit</td>
<td>999</td>
<td>999</td>
<td>100%</td>
</tr>
<tr>
<td>-</td>
<td>Web applications - protected/sensitive Data - PeopleSoft, EndoWorks, Theradoc, Kronos, etc.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Other Encryption Metrics

#### UC Davis Health System

**Client Encrypted Computers**
- **December 2013**
  - 98.4% Encrypted
  - 1.6% Non-encrypted

**Total NAS Containing PHI/PII**
- 48% Encrypted
- 52% Remaining to be encrypted

**Secure Thumb Drives for PHI Data Protection**
- **August 2010 - January 2014**
  - 39% Encrypted
  - 61% Remaining to be encrypted

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### Other Current Security Projects

- **Single Sign-On & Two Factor Authentication for EPCS** - Pilot implementation of Imprivata
- **Network Access Control (NAC)** - CounterACT from Forescout
UC Davis Health System
Cohort Discovery Users and Queries as of January 1, 2014

UC Davis Health System
CTSC Biomedical Informatics
Completed Projects by Year

Dramatic growth in research IT demand

Large data sets

UC wide collaboration
- UC Rex and others
UC Davis SOM and Nursing Faculty

Partnered with Vet Med to add their faculty

Other UCD faculty part of Cancer Center or other Projects / Grants
James D Brandt
Ophthalmology

Fingerprint
- Intracocular Pressure
- Glaucoma
- Ocular Hypertension
- Glaucoma, Open-Angle
- Tonometry, Ocular
- Glaucoma Drainage Implants
- Trabeculectomy
- Antihypertensive Agents
- Visual Field
- Trabecular Meshwork

Fingerprint Trends
Explore the Fingerprint Trends

Research Network
Explore the Expert Network

Publications
1. 2013
   Linde M. Zangwill; Sonia Jain; Keri Dirkes; Feng He; Felipe A. Medeiros; Gary L. Trick; James D. Brandt; George A. Cioffi; Anne L. Coleman; Jeffrey M. Liebmann; et al.
   The rate of structural change: The confocal scanning laser ophthalmoscopy ancillary study to the ocular hypertension treatment study

2. 2012
   Abraham W. Suhr; Michele C. Lim; James D. Brandt; Juan Carlos Izquierdo; Neil Wills
   Outcomes of fornix-based versus limbus-based conjunctival incisions for glaucoma drainage device implant

3. 2012
   Steven L. Mansberger; Mae O. Gordon; Henry Jempek; Anjuli Bhorade; James D. Brandt; Brad Wilson; Michael A. Kass
   Reduction in intraocular pressure after cataract extraction: The ocular hypertension treatment study

Similar Experts
- Martha E. O'Donnell
  67 publications
- Mark J. Mannis
  220 publications
- Mary A. O'Hara
  29 publications
- Fritz Roy E. Curry
  149 publications
- Michele C. Lim
  24 publications

Journals
- American Journal of Ophthalmology
- Ophthalmology
- Archives of Ophthalmology
- Investigative Ophthalmology
- Journal of Glaucoma

Grants
Institutional Network
Coauthor Network
Focus on Clinical Metrics

Clinical Improvement Initiatives - and some Clinical Research projects

- **Sepsis Initiative**
- **Ventilator associated pneumonia (VAP) in the Pediatric ICU**
- **Reduction in central line blood stream infections (CLBSI)**
- **Decrease in catheter associated urinary tract infections (CAUTI)**
- **Reduced number of surgical site infections**
- **Many others**

<table>
<thead>
<tr>
<th>#</th>
<th>Quality Metric</th>
<th>2010 Rate</th>
<th>2011 Rate</th>
<th>2012 Rate</th>
<th>% Change 2010-12</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Central Line Bloodstream Infection*</td>
<td>3.04</td>
<td>2.34</td>
<td>1.69</td>
<td>-44.4%</td>
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<tr>
<td>2</td>
<td>Catheter Associated Urinary Tract Infection*</td>
<td>3.71</td>
<td>2.79</td>
<td>3.39</td>
<td>-8.6%</td>
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<tr>
<td>3</td>
<td>Ventilator Associated Pneumonia*</td>
<td>8.34</td>
<td>5.92</td>
<td>8.00</td>
<td>-4.1%</td>
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<tr>
<td>4</td>
<td>Surgical Site Infection (Standardized Infection Ratio)</td>
<td>1.35</td>
<td>0.63</td>
<td>0.46</td>
<td>-65.9%</td>
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<tr>
<td>5</td>
<td>Inpatient Mortality Index (Observed / Expected)</td>
<td>1.07</td>
<td>0.86</td>
<td>0.83</td>
<td>-22.4%</td>
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<tr>
<td>6</td>
<td>All Sepsis Mortality (% Deaths Observed)</td>
<td>16.91%</td>
<td>12.40%</td>
<td>12.58%</td>
<td>-25.6%</td>
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<tr>
<td>7</td>
<td>30 Day Readmission to Same Hospital (Heart Failure)</td>
<td>12.08%</td>
<td>9.09%</td>
<td>7.64%</td>
<td>-36.8%</td>
</tr>
<tr>
<td>8</td>
<td>PICU Central Line Bloodstream Infection*</td>
<td>8.44</td>
<td>4.44</td>
<td>2.20</td>
<td>-73.9%</td>
</tr>
<tr>
<td>9</td>
<td>PICU Catheter Associated Urinary Tract Infection*</td>
<td>7.00</td>
<td>1.68</td>
<td>3.38</td>
<td>-51.7%</td>
</tr>
<tr>
<td>10</td>
<td>PICU Ventilator Associated Pneumonia*</td>
<td>8.79</td>
<td>4.74</td>
<td>1.58</td>
<td>-82.0%</td>
</tr>
</tbody>
</table>

*Average yearly rate per 1,000 device days*
Outside Assessment

- Davies Enterprise Award 2013
- EMR Adoption Model Stage 7 2012

- Magnet Hospital 2014
- Leapfrog Top Hospital 2013
- NCI ‘Comprehensive’ Designated Cancer Center (41) 2013
- HealthGrades Kidney Transplant Excellence Award (8) 2012
Challenges Going Forward

- Clinical technology regulation growth
  - EHR meaningful use
  - Mandated reporting
  - Increased FDA oversight?

- Insatiable demand for clinical and research IT

- Dramatic changes in Healthcare --- UC Health Initiatives
  - Accountable Care Act
  - More regulations
  - Reduction in revenues - must become more efficient

- UCDHS IT
  - Must replace or upgrade primary data center
  - Aging network - major cost to replace
  - Hardware replacement - cost reduction and efficiency
  - Staff retention
  - Functionality gaps
    - Patient collected data
    - Large data sets driving clinical care and research (+ genetics!)
    - More collaboration for care and research
<table>
<thead>
<tr>
<th>Function or Department</th>
<th>Application Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital and Professional Billing</td>
<td>Resolute</td>
</tr>
<tr>
<td>Managed Care, Referrals, UM/CM</td>
<td>Tapestry</td>
</tr>
<tr>
<td>Admission, Discharge, Transfer, Registration</td>
<td>ADT/Prelude</td>
</tr>
<tr>
<td>Bed Control, Transport, Environmental Services</td>
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<tr>
<td>Scheduling</td>
<td>Cadence</td>
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<tr>
<td>Operating Room and Anesthesia</td>
<td>OpTime/Anesthesia</td>
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<tr>
<td>Radiology</td>
<td>Radiant</td>
</tr>
<tr>
<td>Home Care</td>
<td>Home Health &amp; Hospice</td>
</tr>
</tbody>
</table>
Applications - Sample Projects

- **340B** - new federal pharmacy management requirements
  - UCDHS at risk for $12 million higher annual drug costs
- **ICD10** - major change in clinical coding - impacts revenue
  - CAC - new computer assisted coding application (Nuance/Quantum)
- **340B Phase I** - Implemented MacroHelix (current state interface)
- **EPSi Productivity phase I** - Bi-weekly payroll data
- Cocci lab implementation
- ScrubEx implementation
- Domino Application Remediation (19 apps) to move out of Lotus
- UCPath (HR, Payroll, ANSOS, ecotime, ePerformance & eRecruit)
- EPSi productivity phase 2 and 3
- Legacy Data management
- Meditech LIS upgrade - meaningful use certification
- For EPIC project - 67 interfaces must be build or modified
Technology Management - Sample Projects

- **Building remodeling projects**
  - Cannery C Street Dermatology, Medical Records, BGI, ACC PM&R, Cancer Center Infusion, and other locations

- **Implemented new perimeter network with UCD**
  - Including upgraded Internet connection to 10Gigabit

- **Implemented modern network for new clinical applications**
  - OBIX, Welch Allyn Telemetry, and phase 1 of OR Stryker

- **Completed hospital wireless network modernization**

- **Refresh IBM Power series/AIX Server**

- **Refreshed Hitachi Tier-1 Enterprise Storage**

- **Upgraded from Credant client encryption to Dell Data Protection**

- **Windows 7**
  - Target completion March 2014 - over 8,000 client computers in total

- **Office 365 - with UCD**

- **Nurse Call Upgrade**

- **Output (printing) Management System**

- **Server Virtualization (50% Virtualized)**

- **Vocera VoIP communication badge technology Refresh**
Educational Technology - Sample Projects

- **Replacement of Audio/Visual Technology in Education Building**
  - Replacement of “analog” technology, A/V now fully digital
  - Integration with Center for Health and Technology Building

- **Installation of Lecture Capture system in all classrooms**
  - All classrooms & lecture halls (29) can now record and stream sessions simultaneously
  - Previously only 6 simultaneous sessions could be supported
  - Integrated with MyCourses (Course Management System)

- **Completion of first phase of Curriculum Database (CDB) upgrade**
  - Provides enhanced capability to reflect complex Curriculum Map
  - Completion of initial version of CDB Search Engine

- **Installation of robust Data Analytics tool - eThority**
  - Eliminates need to “develop” reports within applications

- **Completion of On-line Advising support & tracking application**
  - Facilitates online scheduling of student/advisor meetings

- **Completion of Faculty Recruitment Approval Application**
  - Automates submission and tracking of approvals required before a faculty vacancy can be posted

- **School of Medicine Student Information System Enhancements**

- **eFlight Enhancements (online scheduling for 4th year courses)**

- **In process - Initial version of School of Nursing Information System**

- **In process - Initial version of Faculty Information System**
The $36.75 million building opened in the fall of 2012 and includes:

- High tech classrooms to educate the next generation of clinicians in technology-enabled environments
- Extensive Telehealth education space and telemedicine consultation suites
- Simulation and virtual reality with high-fidelity equipment and mannequins
- Broadcast & multimedia facility
- Research space to facilitate industry and academic partnerships

Leadership in statewide initiatives:
- Proposition 1D equipment deployments
- Model eHealth Communities
- Rural PRIME Partnerships
- Clinical Telehealth Service
Health Information Exchange Growth Areas -
• Social Security administration
• New UCDHS physicians at Yuba City moving records from Sutter Health
• New VA interface
• Kaiser Northern CA on 12/18/13

37 organizations
25,773 patient records