Provider Order Entry: Eclipsys Sunrise Clinical Manager (SCM)

Over 150 Hopkins physicians, nurses, and ancillary personnel participated in the POE project, expending over 40,000 hours of effort in the initial deployment in the Department of Medicine (DoM). The system successfully went into full productive use on June 1, 2004, on nine units in the DoM and replaced the core functions of the Ordernet system, which had been in use since May, 1996. The SCM system:

- Will be used in all inpatient and outpatient settings for ordering of all goods and services including medications, laboratory tests, radiology exams, dietary, consults, ancillary services, discharge prescriptions, etc. All communications will be electronic, secure, private, and auditable .
- Will provide a real time on-line view of all ordered, dispensed, and administered medications.
- Will provide the capability to trigger alerts, reminders and rules to improve patient safety, infection control, medication management, and enable Hospital and Medical Board policies.
- Will provide the capability to capture all clinical documentation including nursing, physician, and interdisciplinary notes. The software will have the same richness as the Eclipsys software on the intensive care units including flow sheets, connections to monitors, medication administration records, etc. Hopkins will be able to flex its beds from regular to acute and have the infrastructure to support it.

The core component of work was to build the inventory catalog which includes 3,500 pharmacy items, 3,000 laboratory items, 1,900 radiology items, and over 1,000 items from other departments and services. Each catalog item has 50-80 attributes assigned to it. In addition, the team built over 100 system tables (allergies, units of measure, frequencies, etc), over 450 input forms, over 45 reports, and over 25 Order Sets approved for DoM.

Key safety features include:

- All orders will now be legible, complete, and sent electronically to the receiving department. Required data such as "reason for exam", "dose/route/frequency", "ordering provider signature or co-signature" will be enforced by the software
- Physicians will be alerted to drug-drug, drug-allergy, and dose range limit checks at time of placing the order.
- Approved order sets will be built for each department/division, as required, to ensure complete and accurate ordering.
- All ordered, dispensed, and administered medications will be available on-line for review.
- Medical Logic Modules can be built to trigger alerts and reminders based on clinical practice guidelines.

Over the next nine months the POE Steering Committee plan calls for the deployment in Adult Emergency Department, Psychiatry, and Pediatrics/Pediatrics ED.

HopkinsOne

Progress for Replacing Business Systems

During the winter, SAP was selected as the software to meet the need of JHHS and JHU to replace the current legacy business systems. BearingPoint was chosen as the Integration partner to work with Hopkins to implement the solution. Those decisions marked the start of a very intense Business Process Improvement (BPI) cycle, which is the first step in replacing and improving the business processes for both institutions. Current business processes were reviewed, pain points identified, and strategic business issues documented.

The HopkinsOne project is composed of four functional teams, a technical team, and a business transformation team. All teams are under the direction of Steve Golding, Executive Director for the project.

The technical team, led by Cele DiGiacomo, spent the summer preparing for and implementing the first environment for SAP – the Sandbox. This activity included ordering and building the hardware, building and configuring the base SAP software, and setting up basic security for access to the system. Additionally, the technical team attended the BPI workshops and began to validate requirements for interfaces, reports, conversions, and enhancements (gaps) in new, proposed processes. While the plan is to implement SAP without any modifications, the software has built in exits that allow for additional processing outside of the core code.

The next steps, scheduled to occur October through January are to 'Blueprint' (design) the solution and to build the development hardware and system in preparation for the 'Realization' (build) phase of the project.

Operating Room Management System (ORMIS)—GE Medical Systems

Under the leadership of Drs. John Ulatowski, Fredrick Eckhauser, Lauri Saletnik, RN, Dina Krenzischek, RN, and John Hundt, over 150 physicians, nurses, schedulers, technical, and administrative personnel have been included in the implementation of this project, spending over 20,000 hours of effort. The Scheduling module was successfully implemented on April, 19, 2004, and the core ORMIS functions in GOR, Weinberg, and JHOC successfully went into production on July 1, 2004.

The ORMIS system is designed to provide a complete electronic peri-operative record, decision support, real time views of daily progress in the ORs, and sophisticated reporting. The system includes the following modules:

Scheduling—Provides scheduling of all cases in a graphical interface and supports conflict checking on personnel, equipment, and rooms. *All 87 procedure areas at will eventually be included.*

Doctor Preference Cards—All procedures for all surgeons have been documented and all materials and equipment are included. Each case will have an associated DPC which will then drive the Case Cart and Materials portion of the application. *There are 3,300 doctor preference cards in the system.*

Case Cart—Each case will drive pick lists for central sterile to build a case cart that includes all of the materials and equipment required. This is will help ensure that the clinical team has all it needs to complete the case effectively and efficiently

Case Monitor—The Case Monitor is a real time view of activity in each OR. Specific events such as patient in room, anesthesia start, case start, etc. will be noted during the case and reflected on dedicated displays throughout the OR environment, including family waiting area. The displayed data will vary depending upon the audience.

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ISIS Student Billing System Goes Live

The student billing system (SBS), one of four modules of the new JHU Internet Student Information System (ISIS), went live June 1, 2004 across the entire university. Students will now be able to access and pay their tuition and fees online and business offices will be able to view billing, financial aid, and certain registration information in a single application. The system will eventually eliminate the need for most paper bills.

Many schools have already implemented the admissions module and the financial aid module is currently being used by three pilot schools – Medicine, Nursing, and Public Health – with other divisions soon to follow. The records and registration module is scheduled for completion by summer 2006. Once all four modules are fully implemented, current and prospective JHU students will visit a single website to apply for admission, register for classes, access financial aid, receive their grades, and view and pay their bills.

Barb Shaffer, executive director of the ISIS project notes that the SBS implementation is "a major milestone toward full implementation of ISIS." Shaffer points out that among those who should find the online student billing system particularly helpful are international students and their parents. "In the past, the extra time incurred with international mail – time to receive bills as well as to return payments – has posed a problem for our international students," she says. "With the implementation of the new billing system, bills can be viewed and paid online in a matter of minutes from anywhere in the world."

Enterprise Technology Services and Operations

The mission of Johns Hopkins relies largely on the many varied information systems that support research, education, and healthcare. Ongoing innovations and adoption of information systems into mission critical facets of the Hopkins mission requires that we provide hardened data center facilities to ensure reliable and consistent computer operations. The purchase of the St. Paul Companies' Mt. Washington campus provides a unique opportunity for the IT@Johns Hopkins organization to address strategic issues related to the location, management, and security of these critical systems.

IT@Johns Hopkins, in coordination with the Johns Hopkins University Real Estate Office, has begun work on the renovation of the Mt. Washington Data Center. Preliminary work on facilities and network planning has been performed and approval obtained for the build-out of the new data center facility. Current plans are to complete construction of the facility in late Spring to early Summer of 2005. Select computer systems will be relocated from the 1830 Data Center to the Mt. Washington center with the objective of providing disaster recovery capabilities between the two centers. A high speed dedicated fiber network will be established to provide data replication and switching services.

Also, Data Center Services staff will be relocated to Mt. Washington providing additional space at 1830. This additional space will be used to continue computer system consolidation on the East Baltimore campus as needed to provide common infrastructure and facilities for key research and clinical systems.

Operating Room Management System

Continued from page 1

Peri-operative Documentation—The goal is to capture the entire peri-operative documentation electronically including Pre-op, prep, inter-operative, and post operative.

All anesthesiologists, surgical nurses, PACU nurses, perfusionists, central schedulers, remote schedulers in surgical offices, surgeons, central sterile personnel, ACCM and Surgical administrators, managers, and staff will use the system, totaling approximately 1,200 personnel. Nearly 180 new workstations will be deployed in all procedure areas, including 23 wireless devices on mobile carts. In addition, large flat panel displays of real time OR activity will be placed in selected areas OR procedure areas and family waiting rooms.

Some of the safety features of the system include:

- Allergy, airway, and other alert information captured and pulled forward throughout the case documentation and for future cases
- Surgical site (left, right, bilateral, etc.) captured as a required field.
- With the introduction of clinical documentation, all items used in a particular surgery, including implant serial numbers, will be documented in real-time, thus providing greater ability to audit which instruments were used on specific patients.
- Enhanced ability to note specialty equipment requirements on the doctor preference cards could lead to fewer cases starting without the necessary equipment readily available.
- Ability to correlate pain scores with administration of pain medication, narcotics, and analgesics.

The ORMIS Steering Committee plan calls for deployment in Endoscopy, CVDL, Wilmer Eye Institute, Greenspring Station, and Bayview Medical Center over the next nine months.

Network Update

Internet2 Research Network upgrades

Over the summer, significant upgrades to the local Internet2 (I2) infrastructure were achieved. Networking Services re-engineered the Johns Hopkins I2 link from 45 megabits per second (Mbps) to 1000Mbps for a twenty-two-fold increase in research bandwidth. In addition, Johns Hopkins has become a member of the newer research network called Abilene. The Abilene network is an Internert2 high performance backbone that connects Universities, labs, and research entities in an effort to explore leading edge computing technologies. For additional information on the Abilene network, visit *http://abilene.internet2.edu.*

Upgrades to the Commodity Internet Links

The commodity Internet connections that link Johns Hopkins to the World Wide Web have been increased by 20% to handle our growing connectivity needs to the outside world. Hopkins currently maintains a total aggregate of 110Mbps of bandwidth to the Internet for support of web browsing, file transfers, video streaming, etc. In addition, local web caching servers have been deployed to further reduce transfer times for frequently visited web sites, such as Microsoft, MSNBC, and CNN.

BERNet consortium agreement

In an effort to create a greater emphasis on local partnerships in research, education, and high-speed networking Johns Hopkins worked with local city, state, and university entities in the creation of a new consortium called the Baltimore Education Research Network (BERNet). The purpose of BERNet is to advance the collaborative use of technology and networking in education and research, and work together to share resources for the benefit of all consortium members. An early achievement of BERNet was the creation of a high-speed Internet2 point of presence (POP) in the heart of Baltimore City which allows members to aggregate and share high-speed network services in an economical fashion.

Fiber Paths under construction

As the Johns Hopkins campuses continue to expand there is a growing need to ensure that there is sufficient and reliable network bandwidth to accommodate our data and voice communications. As a result, a significant amount of effort is being invested in the implementation of fiber optics between the major metropolitan campus locations. Today, we are dependent upon vendor provided metropolitan solutions that are limited in functionality and are costly to maintain. Future plans include the build-out and ownership of private fiber backbones that will be able to accommodate our immediate and long-term bandwidth needs. By early next year, private fiber optic backbones will be extended from the newly acquired Mt. Washington campus to the East Baltimore and Homewood campuses. In addition, in the fall, the feasibility of installing fiber to the Peabody Institute and Downtown Center locations will be determined.