

Group Project

Implementation of Patient Hospital Information on Mobile Technology

**Medical Informatics 403-DL Sec 51
Introduction to Medical Informatics**

Submitted By:

Lynne Carveth, Janet Petrowsky, Noreen Phelan, Linda Vind, Anna Winkowski

Instructor: Vik Sheshadri, PHD

[March 12, 2009]

Business Case

The physicians and staff at our hospital do not have access to patient information at the point of care. This situation causes inefficient workflows, repetition of work, unhappy patients, delays in patient care, and the potential to negatively impact our patients' health outcome. We are the only hospital in our community that does not have an electronic medical record (EMR). Our hospital is falling behind in meeting a patient expected community standard. Our hospital's financial situation does not currently allow us to implement a full EMR system. We will be presenting our recommendations as a major first step to resolving this issue.

First Recommendation

Develop or purchase an application that would be able to capture patient information when arriving at the hospital. This information would be stored in the Hospital's Informational Data Store located onsite.

This information would later be displayed on wireless handheld devices by nurses and physicians.

It would also be available on the computers at the Nurses Station on the floor.

Presented on the next few pages are prototypes of screens we would like to employ.

The screens were designed by nurses. By having screens designed by nurses it makes them more intuitive and user friendly. The nurses have a sense of ownership and are more willing to integrate them into their workflow. Patients will therefore have a better experience in our hospital.

We would be open to partnering with the vendor of choice, to make these screens commercially available.

First Screen-Secure Login

PDA – EHR Interface

User Log In

ID:

Password:

Enter Patient Data

MR No:

DOB:

Second Screen-Demographics Page

Patient Demographics		Medical Record No. <input type="text" value="006661023"/>		Current Room No <input type="text" value="4116"/>	
Address 882 Grove Rd Pittsburgh, PA 15212		Patient Name <input type="text" value="Vanderhoffen, Evelyn"/>			
Phone Numbers Home 412-637-1318 Work 412-358-9905 Cell 412-415-2020		Date of Birth <input type="text" value="02/10/1954"/>		Patient's Age <input type="text" value="55"/>	
Social Security No. XXX-XX-8123		Admission Date <input type="text" value="03/13/2009"/>		Today's Date <input type="text" value="03/15/2009"/>	
Primary Contact Vanderhoffen, Gabriel		Time <input type="text" value="13:47:02"/>			
Occupation Accountant		Relationship Husband		Insurance UPMC Advantage HMO Phone 888-876-2756 Policy No. 001088-A02	
Employer Jordan Tax Service 1846 Easy Street Pittsburgh, PA 15237		Admitting Diagnosis Abdominal Pain, Shortness of Breath		Primary Care Physician Gold, Gordon M.D.	
Relationship Husband		Phone Numbers Home 412-637-1318 Work 412-342-9715 Cell 412-415-2021		Allergies NKFA, Mold, Pollen PCN, IV Dye	
Admitting Physician Gerard, Joseph M.D.					
<input type="button" value="Edit Demographics"/>					
Address Street		Phone Numbers			
<input type="text"/>		Home: <input type="text"/>		Work: <input type="text"/>	
Address City		Address State		Zip Code	
<input type="text"/>		<input type="text"/>		<input type="text"/>	
Employer		Primary Contact		Relationship	
<input type="text"/>		<input type="text"/>		<input type="text"/>	
Contact Numbers		Home:		Work:	
<input type="text"/>		<input type="text"/>		<input type="text"/>	
Address City		Address State		Zip Code	
<input type="text"/>		<input type="text"/>		<input type="text"/>	
Occupation		<input type="text"/>			
Primary Care Physician		Allergies			
<input type="text"/>		<input type="text"/>			
Insurance		Phone		Policy Number	
<input type="text"/>		<input type="text"/>		<input type="text"/>	
<input type="button" value="Upload to EHR"/>					

Third Screen-Past Medical History (Keys into ICD9-CM Coding for Billing Purposes)

Patient Past Medical History

Asthma
Cholecystectomy
Hypothyroidism
Septoplasty
Sinusitis
Tonsillectomy

Medical Record No.	006661023	Current Room No	4116
Patient Name	Vanderhoffen, Evelyn		
Date of Birth	02/10/1954	Patient's Age	55
Admission Date	03/13/2009		
Today's Date	03/15/2009	Time	13:47:02

Click to Add

<p>Cardiology</p> <p><input type="checkbox"/> Angina Pectoris <input type="checkbox"/> Aortic Aneurysm <input type="checkbox"/> CAD <input type="checkbox"/> CABG <input type="checkbox"/> CHF <input type="checkbox"/> Digitalis Toxicity <input type="checkbox"/> MI</p> <p>Cancer</p> <p><input type="checkbox"/> Bladder CA <input type="checkbox"/> Breast CA <input type="checkbox"/> Cervical CA <input type="checkbox"/> Colorectal CA <input type="checkbox"/> Esophageal CA <input type="checkbox"/> Gastric CA <input type="checkbox"/> Leukemia <input type="checkbox"/> Lung CA <input type="checkbox"/> Prostate CA</p>	<p>Respiratory</p> <p><input type="checkbox"/> Acute Respiratory Failure <input type="checkbox"/> Asthma <input type="checkbox"/> COPD <input type="checkbox"/> Emphysema <input type="checkbox"/> Pleural Effusion <input type="checkbox"/> Pneumonia <input type="checkbox"/> Pulmonary Edema</p> <p>Endocrine</p> <p><input type="checkbox"/> Adrenal Insufficiency <input type="checkbox"/> Diabetes Insipidus <input type="checkbox"/> Diabetes Mellitus <input type="checkbox"/> Hyperthyroidism <input type="checkbox"/> Hypothermia <input type="checkbox"/> Hypothyroidism <input type="checkbox"/> Ketoacidosis</p>	<p>Gastrointestinal</p> <p><input type="checkbox"/> Appendicitis <input type="checkbox"/> Bowel Resection <input type="checkbox"/> Colostomy/Ileostomy <input type="checkbox"/> Diverticulitis <input type="checkbox"/> Duodenal Ulcer <input type="checkbox"/> Hepatitis <input type="checkbox"/> Pancreatitis</p> <p>Psychological</p> <p><input type="checkbox"/> Anxiety <input type="checkbox"/> Bipolar <input type="checkbox"/> Dementia <input type="checkbox"/> Depression <input type="checkbox"/> Drug Addiction <input type="checkbox"/> Obesity <input type="checkbox"/> Schizophrenia</p>	<p>Neurological</p> <p><input type="checkbox"/> Alzheimer's <input type="checkbox"/> Brain Tumor <input type="checkbox"/> Cerebral Aneurysm <input type="checkbox"/> CVA <input type="checkbox"/> Parkinson's <input type="checkbox"/> Seizure <input type="checkbox"/> TIA</p> <p>Circulatory</p> <p><input type="checkbox"/> Anemia <input type="checkbox"/> DVT <input type="checkbox"/> Embolism <input type="checkbox"/> Hypertension <input type="checkbox"/> PVD <input type="checkbox"/> Sepsis <input type="checkbox"/> Shock</p>	<p>Genitourinary</p> <p><input type="checkbox"/> Acute Renal Failure <input type="checkbox"/> BPH <input type="checkbox"/> Chronic Renal Failure <input type="checkbox"/> Dialysis <input type="checkbox"/> EndStage Renal Failure <input checked="" type="checkbox"/> Renal Calculi <input type="checkbox"/> Urostomy</p>	<p>MusculoSkeletal</p> <p><input type="checkbox"/> Amputation <input type="checkbox"/> Fracture <input type="checkbox"/> Gout <input type="checkbox"/> Multiple Sclerosis <input type="checkbox"/> Osteoarthritis <input type="checkbox"/> Osteoporosis <input type="checkbox"/> Rheumatoid Arthritis</p> <p>Ear/Nose/Throat</p> <p><input type="checkbox"/> Cataracts <input type="checkbox"/> Glaucoma <input type="checkbox"/> Detached Retna <input type="checkbox"/> Laryngeal CA <input type="checkbox"/> Macular Degeneration <input type="checkbox"/> Sinusitis</p>
---	---	---	--	---	---

Fourth Screen-Medication List

Patient Medication List

Atenolol 25 mg PO Daily
Levoxyil 75 mcg PO Daily
Ibuprofen 400 mg PRN
Omega-3 1 UD tab PO Daily
Multi Vitamin 1 UD tab PO Daily

Medical Record No.	006661023	Current Room No	4116
Patient Name	Vanderhoffen, Evelyn		
Date of Birth	02/10/1954	Patient's Age	55
Admission Date	03/13/2009		
Today's Date	03/15/2009	Time	13:47:02

Click to Add

<p>Drug Category</p> <p><input type="checkbox"/> Anti-Alzheimer's <input type="checkbox"/> AntiAnemic <input type="checkbox"/> AntiAnxiety <input type="checkbox"/> AntiAsthmatics <input type="checkbox"/> AntiCholinergics <input type="checkbox"/> AntiConvulsants <input type="checkbox"/> AntiDepressants <input type="checkbox"/> AntiDiabetics <input type="checkbox"/> AntiDiarrheals</p>	<p><input type="checkbox"/> AntiEmetics <input type="checkbox"/> AntiFungals <input type="checkbox"/> AntiHistamines <input type="checkbox"/> AntiInfectives <input type="checkbox"/> AntiParkinsons <input type="checkbox"/> AntiPlatelets <input type="checkbox"/> AntiPsychotics <input type="checkbox"/> AntiPyretics <input type="checkbox"/> AntiRetrovirals</p>	<p><input type="checkbox"/> AntiRheumatics <input type="checkbox"/> AntiTuberculars <input type="checkbox"/> AntiUlcer Agents <input type="checkbox"/> AntiVirals <input type="checkbox"/> Beta Blockers <input type="checkbox"/> Bone Resorption Inhibitors <input type="checkbox"/> Bronchodilators <input checked="" type="checkbox"/> Calcium Channel Blocker <input type="checkbox"/> CNS Stimulants</p>	<p><input type="checkbox"/> Corticosteroids <input type="checkbox"/> Diuretics <input type="checkbox"/> Hormones <input type="checkbox"/> ImmunoSuppressants <input type="checkbox"/> Laxatives <input type="checkbox"/> Lipid-Lowering Agents <input type="checkbox"/> Minerals/Electrolytes/PN Modifiers <input type="checkbox"/> Natural Herbal Products <input type="checkbox"/> NonOpioid Analgesics</p>	<p><input type="checkbox"/> NSAIDS <input type="checkbox"/> Opioid Analgesics <input type="checkbox"/> Sedative/Hypnotics <input type="checkbox"/> Skeletal Muscle Relaxants <input type="checkbox"/> Thrombolytics <input type="checkbox"/> Vaccines/Immunizing Agents <input type="checkbox"/> Vascular Headache Suppressants <input type="checkbox"/> Vitamins <input type="checkbox"/> Weight Control Agents</p>
--	--	---	---	--

Dose:

Route:

Frequency:

Fifth Screen-Patient Assessment

Patient Assessment

Patient Specific Norms

Hard Of Hearing
Flat Affect
Chronic Back Pain

Click to Add

Neurological/Psychological

WNL
 Disoriented to Self
 Disoriented to Place
 Disoriented to Time
 Disorganized Thinking
 Decreased LOC
 Inattention
 Anxious
 Depressed
 Agitated

MusculoSkeletal

WNL
 Contracture
 Flaccid
 Weakness
 Limited ROM
 Unsteady Gait
 Assistive Device

HEENT

WNL
 Difficulty Swallowing
 Difficult Liquids
 Facial Droop
 Oxygen
 Rhonchi
 Rales

Skin/Dressing

WNL
 Stage Wound
 Pressure Ulcer
 Ecchymosis
 Rash
 Incision Edges Well Approximated

Pain

Scale
 Location
 Factors
 Radiation
 Relief Measures

Medical Record No.	006661023	Current Room No	4116
Patient Name	Vanderhoffen, Evelyn		
Date of Birth	02/10/1954	Patient's Age	55
Admission Date	03/13/2009		
Today's Date	03/15/2009	Time	13:47:02

Type Nurse's Notes

Edema

Upload to EHR

Sixth Screen-Patient Vitals

Patient's Vitals

Patient's Average Vitals

BP: 127/85
Temp: 87.8 F / 30.6 C
Heart Rate: 72
Height: 65 inches / 162.5 cm
Weight: 152 lbs / 69 kg

BMI 25.3

Click to Add

Vitals Trends

NOW

Temperature: 98.6
HeartRate: 84
Respirations:
BP Systolic:
BP Diastolic:
Oxymetry:
Weight:

Medical Record No.	006661023	Current Room No	4116
Patient Name	Vanderhoffen, Evelyn		
Date of Birth	02/10/1954	Patient's Age	55
Admission Date	03/13/2009		
Today's Date	03/15/2009	Time	13:47:02

Type Nurse's Notes

Blood Pressure Lying Sitting Standing
 Right Arm Left Arm Right Leg Left Leg

Heart Rate Apical Radial Brachial Femoral

Temperature Oral Axillary Rectal

Return to Assessment **Upload to EHR**

	NOW	3/15 0752	3/15 0347	3/15 0010	3/14 1956	3/14 1549	3/14 1151	3/14 0748	3/14 0355	3/14 0011	3/13 1850	3/13 1557
Temperature:	98.6	98.4 F	97.1 F	96.2 F	97.2 F	98.8 F	98.8 F	98.6 F	96.9 F	96.7 F	97.2 F	98.4 F
HeartRate	84	78 bpm	61 bpm	62 bpm	71 bpm	82 bpm	81 bpm	78 bpm	63 bpm	64 bpm	68 bpm	84 bpm
Respirations		18	20	18	18	20	20	18	18	18	20	20
BP Systolic		119 /	132 /	125 /	119 /	119 /	119 /	119 /	119 /	119 /	119 /	119 /
BP Diastolic		78	84	79	78	78	78	78	78	78	78	78
Oxymetry		96%	97%	97%	96%	100%	99%	98%	97%	96%	96%	100%
Weight		152 lbs		153 lbs								

7 8 9
4 5 6
1 2 3
0 .

Second Recommendation - Technology Employed

The Palm T/X would be used for the handheld device. It does not have a phone but it does have a large, 3.25 x 2.2 inch, color screen. It has a built-in web browser and Wi-Fi technology with a good signal range which may require some new technology for the hospital. The Palm T/X has Bluetooth technology which can run concurrently with the Wi-Fi so you can be mobile while using it. However, it does require synchronization with the participating computers. The Palm T/X has 128mb of non-volatile flash memory and the actual storage capacity is 100mb. It has tremendous expansion capabilities using the SD, SDIO, or MMC cards. With this device a person could use email and can download, edit, and read Word, Excel, PowerPoint, and Outlook. Digital photos and video clips can also be created. The Palm Company has a large business-technology support already in place and has the most software that can be utilized for our immediate purposes. Through researching and comparing devices, especially the Blackberry, the Palm T/X has clearly proven to be the workhorse of handheld devices in the medical arena and there is no evidence of change at this time. However, new technologies are being developed at an astounding rate. New devices have just been released but they have not established themselves nor do they have the software choices of this Palm. The added benefits of this device are that it has a very long record of positive reviews and no additional phone charges. The volume purchase price of \$272 per device makes this powerful device competitive now and for some time in the future.

Second Recommendation References

www.palminfocenter.com, <http://store.palm.com>, <http://www.skyscape.com>

Third Recommendation - Software Requirements

There were some guidelines that the project needed to meet to move forward. Regardless if the Software was provided by a vendor or developed in house.

Security – Meet at a minimum HIPAA security Standards for Electronic Health Care Information. HIPAA has specific policies that cover the accessing of Electronic Protected Health Information (EPHI). Through the guidelines set forth in the Department of Health and Human Services document “HIPAA Security Guidance” each product we review must meet those standards. The standards were set forth due to the potential of personal health information being leaked to parties that the patient did not give access to via non secured transmissions to mobile electronic devices, including PDAs.

Customization- Vendor software must be customizable, to enable incorporation of our screens that we have designed.

Maximum Cost to Hospital-The ceiling price of the product can not exceed an initial cost of \$200,000. The annual cost thereafter must not exceed \$35,000.

Future Potential- Vendor must be forward thinking in the development of the software; Allowing for future enhancements to meet new standards as well as customer improvement request(s). This would ensure that we will be integrating any of the technology solutions that are developed into a future EMR at the hospital.

If we do select vendor software, we would like to be able to partner with them in our desire to meet a near term future goal after a successful integration of the software to meet this project's goals. First - we would like the data that is being captured to be downloaded into a Personal Health Record (PHR). This would definitely add value to the hospitalized patients' future healthcare, as they would not have to maintain and update their PHR. The second enhancement would be when the patient is admitted, notify their primary care physician (PCP) that their patient is in the hospital. There would also be notification to the PCP upon the patient's discharge, identifying what the outcome of the hospital stay was and what follow-up is required.

For these enhancements the hospital would be highly interested in participating in any requirements setting, pilot activities and/ or alpha/beta testing.

Device Specific- Software must be downloadable to all of our chosen devices - PDA - the Palm T/X, Desktop PC at the Nurses Stations, Laptops, and Tablet PCs.

Product must be in a Production Ready State – We do not want to be in an alpha or beta testing situation for this business case. We want a product that is stable and can be integrated into our Hospital in a timely fashion.

Reviewed Products:

MercuryMD MData - this product which is owned by Thomson Reuters has been integrated under the Clinical Xpert suite of tools¹.

Opus Mobility – This tool works on industry standard Microsoft PDA devices – the Palm T/X is not a Microsoft PDA device².

Thomson Reuters' Clinical Xpert – Used by Hospitals, staff and affiliated practice physicians who make rounds at hospitals and by Hospital Nurses³.

GE Centricity EMR – Used by Ambulatory Care Physicians and clinical staff to document patient encounters⁴.

Product chosen for Proof of Concept:

Thomson Reuters' Clinical Xpert

¹ <http://www.micromedex.com/>

² http://findarticles.com/p/articles/mi_hb5558/is_200711/ai_n22053600

³ <http://www.micromedex.com/products/cxnavigator/index.html>

⁴ http://www.gehealthcare.com/usen/hit/products/centricity_practice/emr_index.html

Rationale

We want a quality product that meets our needs. Through researching and reviewing the product we believe this is the best choice in the market. Below is an excerpt, indicating that their other customers have found them to be responsive and customer focused.

Clinical Xpert Navigator has been recognized as the Category Leader for Mobile Data Systems in the "Top 20 Best in KLAS Awards: Software & Professional Services" report. Report released in January 2009. It has been named Number One in the Mobile Data System Category 7 years in a row. Clinical Xpert Navigator beat the competition in virtually every major category evaluated by KLAS, a research firm that monitors and reports on the performance of healthcare technology vendors. Customers awarded Clinical Xpert Navigator outstanding scores on primary indicators such as "money's worth," "quality and timeliness of interfaces" and "helps your job performance." And Navigator scored 94 percent or higher on key business indicators such as "would buy again," and "client's best or one of the best vendors." In addition, Navigator scored 8.41 out of a possible 9 points on the overall product quality rating.⁵

It meets all of our requirements.

- It exceeds all HIPAA Security Requirements.
- Price – approximately \$150,000 for our 200 bed hospital
 - Annual fee approximately \$26,000
- Rapid integration, 8-12 weeks
- Patient Rounding Tool
 - Provides patient information in a familiar, Configurable, and easy-to-view format.
- Lifetime Mobile Record
 - Provides valuable, chronological summaries of hospital encounters with lifetime access to

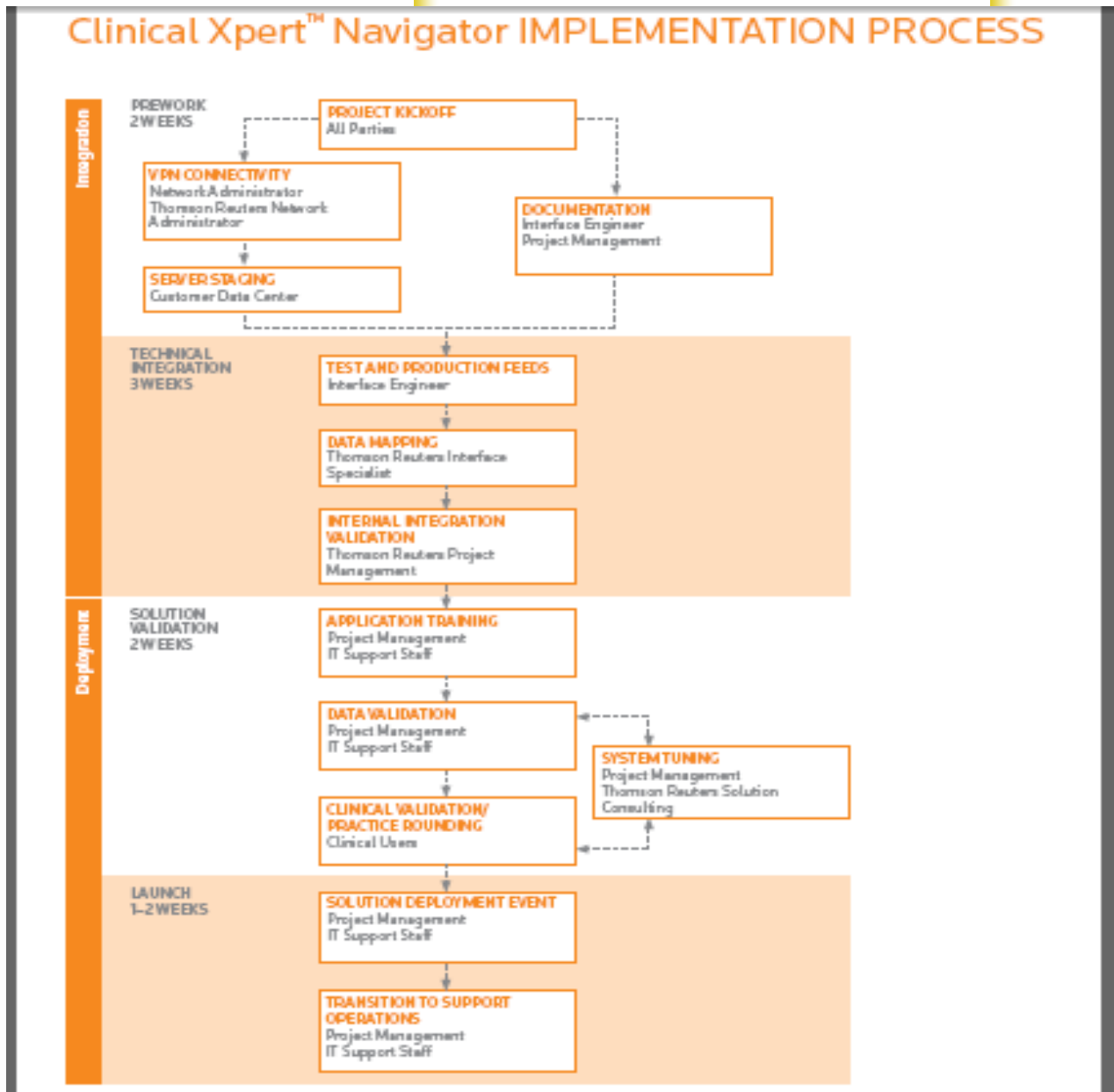
⁵ http://thomsonreuters.com/content/press_room/tsh/mdx_thClinicalXpert_Tops_KLAS

Patients' extensive History and Physical Exams (H&Ps) and discharge summaries, improving continuity of care for frequently admitted patients.

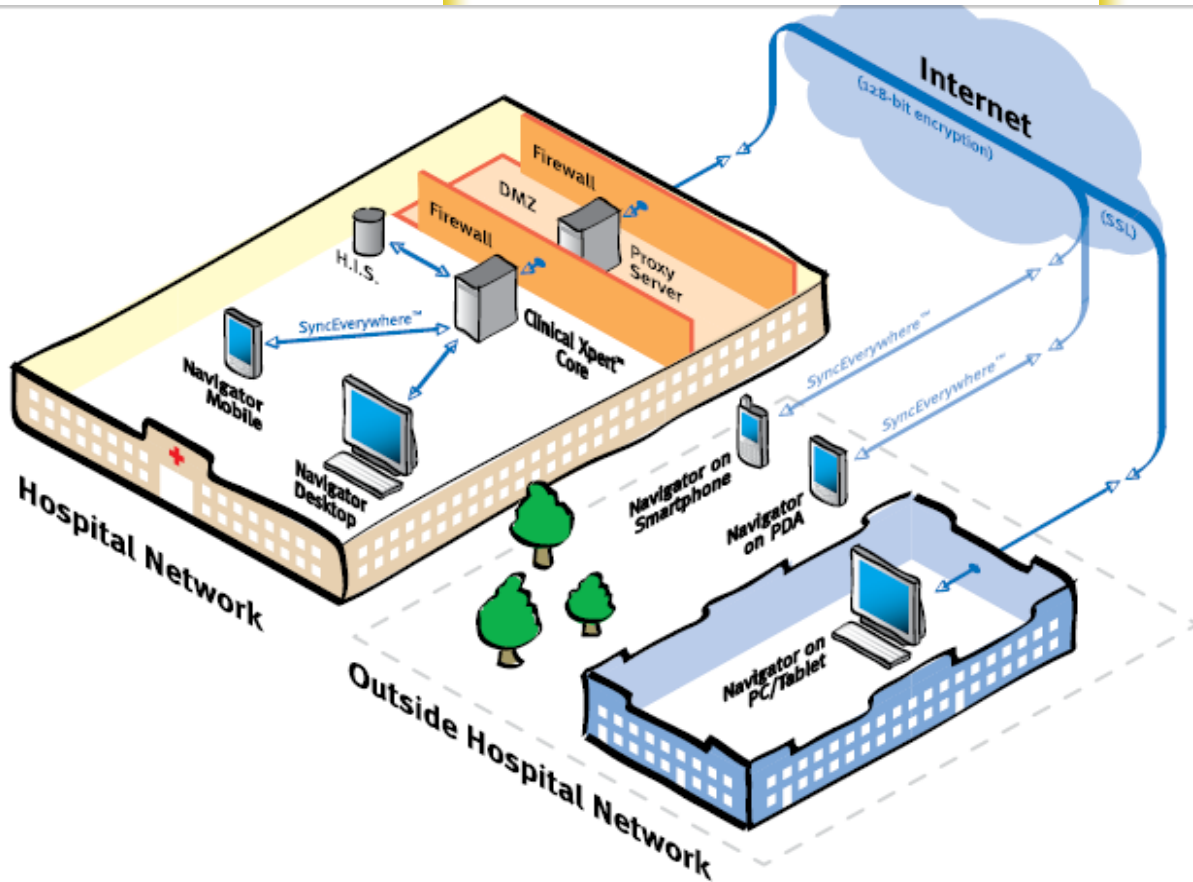
- Charge Capture - Enables physicians to quickly record and transmit procedure and diagnosis codes relevant to hospital encounters for improved revenue capture.
- Handoff - Improves communication and collaboration among care team members with a highly visible and centralized exchange of information and tasks.

Clinical Xpert has developed a methodology for implementation.

We will be integrating our internal education process within their methodology.



⁶ http://www.micromedex.com/products/clinicalxpert/implementation_process.pdf



7

Diagram depicting where Clinical Xpert can be accessed and the security layer.

Acknowledgement:

Thanks to Annette Reyes from Thomson Reuters for discussing the product and prices for this project.

7

http://www.micromedex.com/products/cxnavigator/Sell_Sheet_CX_Navigator_1008_10.pdf

Fourth Recommendation- Workflow Changes

The current nursing workflow is not only inefficient but also inconvenient and time-consuming. To ameliorate this problem, our team proposes the investment of PDAs, which would be distributed to all full-time nursing staff.

The PDA is a small hand-held device which could be synchronized with larger computers. It allows nurses to access patients' charts, and give them the ability to fill out and submit nursing forms.

There are several workflow categories that would be positively impacted by the use of PDAs (Cipriano, 2008). Among them are:

- Admission/Discharge/Transfer or ADT
- Care Delivery
- Communication
- Coordination of Care
- Documentation
- Medication Management
- Patient Movement

Admission/Discharge/Transfer

In a report by the Medicare Payment Advisory Committee, they noted that 8.8 percent of patients were readmitted within 15 days, while 13.3 percent were readmitted within 30 days (Commision, 2007). By having the ability to bring up patients' history on readmission, nurses save time in admitting the

patient. Patients would only need to validate the data that is already in the system during their previous admissions.

Care Delivery

Because nurses spend less time at the nursing stations and are able to be mobile with their devices, they have more time to spend providing care to their patients.

Communication

As vital signs and assessments are downloaded immediately into the Data Store, abnormal results are accurately communicated to physicians and other clinicians in a timely manner.

Coordination of Care

Clinicians who are receiving patients transferred from one unit to another would have complete access of the clinical data and physician orders eliminating the delay of treatment.

Documentation

According to a Nurse Week article, “the use of PDA is cutting the time nurses spend on paperwork from three to four hours per shift to one to one and a half hours.” (Lindsay, 2001). A traditional workflow in acquiring vital signs would be:

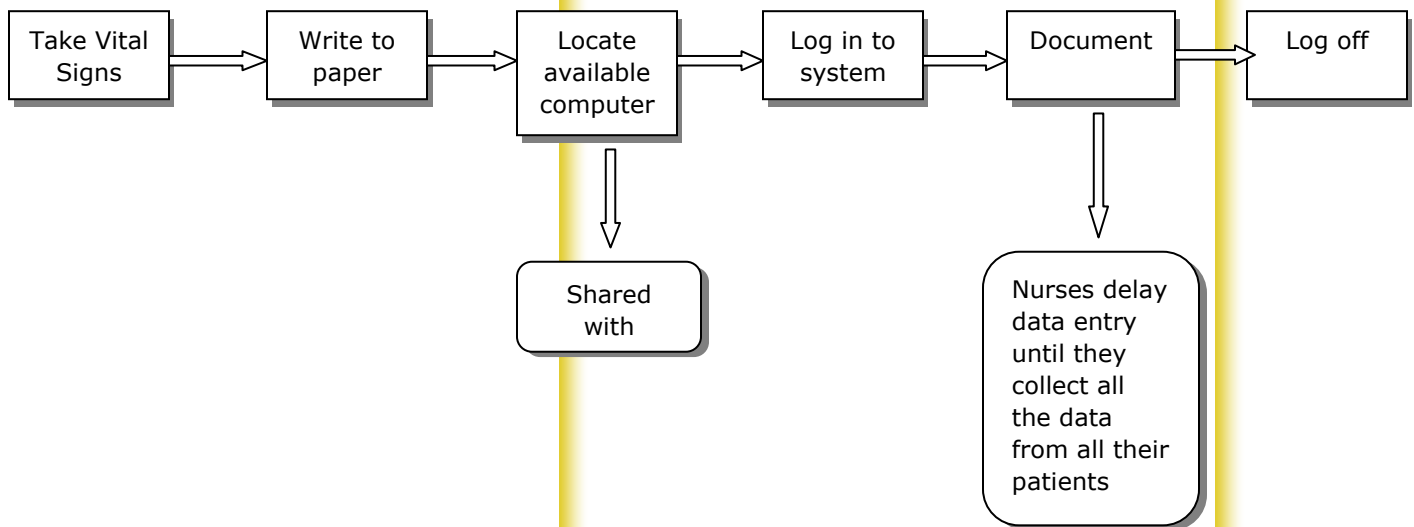


Figure 1. Traditional VS acquisition workflow. Source: UCSF Medical Center

With the PDA, a typical workflow in vital signs acquisition would look like this:

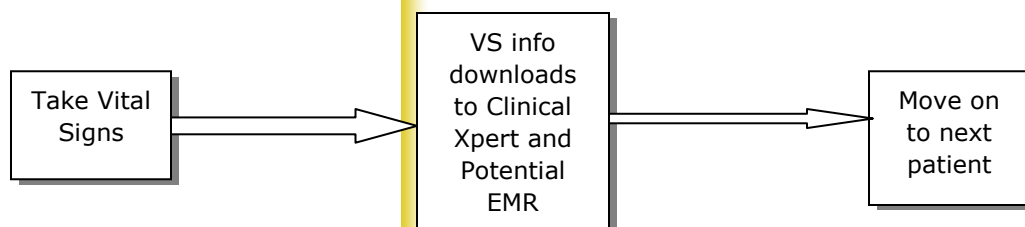


Figure 2. Revised VS acquisition workflow. Source: UCSF Medical Center

This revised workflow decreases data entry errors, increases efficiency and reduces the likelihood of losing valuable time that could be spent providing patient care instead.

Medication Management

PDAs will help nurses reconcile the medications patients are taking at home compared to the medications they are receiving while inpatient.

Patient Movement

The time nurses spend helping transfer a patient to a different unit would be significantly reduced unless it is absolutely necessary to transfer the patient to an intensive care unit.

Providing nurses with PDAs will not only improve the nursing workflow, it would also improve patient care, reduce errors, increase nursing productivity and improve staff satisfaction.

References for the Fourth Recommendation:

Center, U. o. (2007, October). Improving Quality of Care and Nursing Workflow: A Clinician Usability Pilot of the Motion C5 Mobile Clinical Assistant. San Francisco, California, USA.

Cipriano, P. P. (2008, February 25). *American Academy of Nursing*. Retrieved February 3, 2009, from aannet.org:
http://www.aannet.org/files/public/HIMSS_final_with_devices_Cipriano.ppt

Commision, M. P. (2007). *Report to the Congress: Promoting Greater Efficiency in Medicare*. Washington, D.C.: MedPac.

Lindsay, C. (2001). PDAs give nurses more time. *NurseWeek* .

Fifth Recommendation-Communication Plan

The plan of communicating to staff and the public at large would occur in three phases.

Phase I (6 months from training)

1. Posters: Contact PR Department for design/advertising team and print shop.
2. Newsletters and News Media: Contact PR Department for contacts regarding press releases.
3. Hospital Information Channel: Contact PR Department for designated company to produce information session.
4. Hospital Website: Request for redesign and additional "What's New" section of website given to website manager.

Phase II (4 months from training)

1. Posters: Will display the handheld device and mention electronic medical records for the hospital. Websites for further investigation will be offered. 50 posters will be created to be placed in the cafeteria, elevators, staff lounges, and gathering areas within the hospital.
2. Newsletters and News Media: Will be delivered to staff, neighbors, patients and news outlets that will include the promotion of the new handheld device and its capabilities. Workflow improvements and admission ease to be mentioned.
3. Hospital Information Channel: Will contain a one minute information session about the new device, improved workflow, and ease of admissions. Mention of electronic medical records will be included at this venue.
4. Hospital Website: Will show the handheld device and brief statement on ease of admissions and improved workflow on home page. The "What's New" section of website will discuss the benefits in greater detail.

5. Medical Staff Office: Request an email to be sent to all physicians regarding the new software available to them (on their own handheld devices) and upcoming training information and contacts.

Phase III (2 months from training)

1. Staff Meetings: Will discuss training including days and times offered. Workflow improvements for each unit will be discussed and expectations regarding security. Attendance for training is mandatory. Technical questions will be forwarded to training staff.
2. Posters: Remain unchanged
3. Newsletters: Will include training dates and times as well as contact information for training staff.
4. Hospital Information Channel: Remains unchanged
5. Hospital Website: Remains unchanged
6. Screens Savers: Display on hospital computers the handheld device and promotion message.
7. Meet and Greet: Demonstration of handheld device and software capabilities to be located near the staff entrance. The demonstration will be conducted by training staff two weeks prior to actual training.
8. Medical Staff Offices: Request a reminder email to be sent to all physicians to attend training sessions along with training information and contacts.

Sixth Recommendation-Training Needs

Palm TX Implementation Project Impact – Need for Training

The Palm T/X Clinical Implementation will impact nursing staff and nursing assistants in all hospital units including the Emergency Department. The Palm Implementation will also impact both Hospitalist and affiliated physicians. All end users will be required to attend training prior to using the Palm T/X in the hospital setting. Required training will include review of required security and confidentiality topics, basic navigation skills, electronic clinical forms, and communication tools. The training will incorporate expected new workflows. Super Users will need to be identified and trained for each Nursing Unit. This will provide an onsite asset during implementation. Training is a significant cost to the organization but it is needed for staff to successfully incorporate new technology into the patient care setting. “If patient – care systems are to be effective in supporting better care, healthcare professionals must possess the informatics competencies to use the systems.”¹

Organization Approach to Project Hospital Training

Training Development

It is organizational expectation at Our Hospital that a formal Instructional Systems Development (ISD) model be followed when designing any hospital training. The ISD model requires training staff to follow a process that allows for analysis, design, development, implementation and evaluation. This is accomplished by having a member of the training team be actively involved as part of the project team.

Training Department Philosophy

Our Hospital Training Department incorporates adult learning principles into all training development and implementation. The training model that Our Hospital uses allows students to see relevance to their own life experiences, allows students some control over the training, and provides

for active student involvement. It most importantly brings in relevance to student's job roles. The training format that is used is a blended format that will address all learning styles- auditory, visual, and kinesthetic. It is noted that telling a student something results in only 10 % retention in 3 days, showing a student something results in 20 % retention in 3 days. With a blended approach to training retention is increased to 65% at 3 days post training. Students will also retain information better if the training is designed to incorporate the student's prior knowledge and life experiences and if they understand the relevance to the job that they perform.

Goals of Training

The primary goal of Our Hospital Training Department is to provide learner centered training that will allow for the student to be able to successfully transfer learning into their work setting. Staff must be able to perform the new skills when they are back on the unit, not just have awareness. Meeting the training goal is important for staff satisfaction, optimal use of technology, and positive impact on patient care and outcomes.

Training Department Resources Assigned To Project

Name	Position	Role	Phone Number
Mary Manager	Training Manager	Project Management	222-2222
Jane Instructor	Training Instructor	Materials Development for class room and online and Classroom Instruction	333-3333
Savannah Instructor	Training Instructor	Materials Development for classroom and proficiency assessment and Classroom	444-4444

		Instruction	
Sally Scheduler	Training Scheduler	Registration and Attendance Tracking Proficiency tracking and reporting	555-5555

Training Department Deliverables

- Development of curriculum
- Quick Reference Guide for each end user
- On Line Training Content Posted to Hospital Intranet Training Site
- Online proficiency assessment
- Workflow Demonstration Script for in class assessment
- Instructor Lead Class Room Training Hospital physicians and staff
- Instructor Lead Class Room Training affiliated physicians
- Instructor Lead Class Room Training for Support Staff – Unit Resource and Help Desk
- Training Schedule to accommodate multiple shifts
- Resources assigned to project team
- Post project summary and training evaluation

Training Class Details

Class curriculum is role and workflow focused with emphasis on successfully incorporating the technology into the real life clinical setting.

Nursing and Physician Class

2 Hour Class Session

Security and Confidentially

10 Minutes

- Review Organizational Security and Confidentiality Policy
- Palm TX Security Features

Navigation

20 Minutes

- Palm Basic Navigation

Clinical Screens and Work Flows 60 Minutes

- Basic Palm TX Function
- Patient Demographics Screen
- Medical History Screen
- Vital Sign Screen
- Assessments Screen
- Medication History Screen
- Patient Intake Workflow
- Patient Transfer Workflow
- Patient Assessment Workflow
- Communication Workflow
- Review of typical errors and problem areas
- Practice Time

Proficiency Assessment 30 Minutes

- On line Assessment
- Return demonstration of clinical workflows
- Class Evaluation

Nursing Assistant Class 1 Hour Class Session

Security and Confidentially 10 Minutes

- Review Organizational Security and Confidentiality Policy
- Palm TX Security Features'

Navigation 10 Minutes

- Palm Basic Navigation

Clinical Screens and Work Flow 20 Minutes

- Basic Palm TX Function
- Patient Demographics Screen
- Vital Sign Screen
- Assessments Screen
- Patient Assessment Workflow
- Review of typical errors and problem areas
- Practice Time

Proficiency Assessment 20 Minutes

- On line Assessment
- Return demonstration of clinical workflows
- Class evaluation

Help Desk Class

2 Hour Class Session

Security and Confidentially 10 Minutes

- Review Organizational Security and Confidentiality Policy
- Palm TX Security Features'

Palm Technical Aspects 30 Minutes

Navigation 60 Minutes

- Palm Basic Navigation
- Palm Use in Clinical Setting
- Review of typical errors and problem areas
- Practice Time

Proficiency Assessment 20 Minutes

Nursing – Super User Class 1 Hour Class Session

Review of Clinical Screens and Work Flow 60 Minutes

- Basic Palm TX Function
- Patient Demographics Screen
- Medical History Screen
- Vital Sign Screen
- Assessments Screen
- Medication History Screen
- Patient Intake Workflow
- Patient Transfer Workflow
- Patient Assessment Workflow
- Communication Workflow

Review of typical errors and problem areas

How to Resolve Typical Errors

Practice Error Resolution Scenarios

Supporting the End User

Audience/Training Delivery:

End Users	Number of End Users	Number of Classes To Be Held	Training Delivery Method	Training Time
Nursing Staff Hospital and ED	120 40/shift	15 classes 8 students per class	Hands On	2 Hours
Nursing Assistants	60 20/shift	6 classes 10 students per class	Hands On	2 Hours
Physicians and Residents – Hospital	20	5 classes 4 students per class	Hands On	2 Hours
Physicians - Affiliated	50	10 classes 5 students per class	Hands On	2 Hours
Unit Resource	30	10 classes 3 Students per class	Hands On	1 Hour
Help Desk	15	3 classes 5 students per class		

Make Up Classes				
Scheduled Physician	TBD	2 Classes	Hands On	2 Hours
Scheduled Nurse	TBD	4 Classes	Hands On	2 Hours
Scheduled Assistant	TBD	2 Classes	Hands On	1 Hour
Help Desk staff	3	1 Class	Hands On	2 Hours
Totals		58 Classes		

Resource Hours

Phase / Tasks	Manager Hours	Lead Instructor Hours	Instructor Hours	Admin Assistant
Project Kick Off	1	1	1	
Project Plan Creation	4	0	0	
Training Research	2	8	8	
Training Plan Creation	6	0	0	
Creation of Reference Materials , proficiency assessments	0	40	40	
Curriculum Creation	0	40	20	
Class Room Training	0	49	49	
Issue Resolution	4	2	2	

Class Registration and scheduling		0		10
Total Hours	17	140	120	10
Cost Per Hour	\$35.00	\$25.00	\$25.00	\$12.00
Total Resource Cost	\$595.00	\$3500.00	\$3000.00	\$120.00

Training Budget

Role	Cost Per Unit	Budget	Budget \$	Actual \$	Balance \$
Training Manager – Project Management	\$35.00 / Hour	17 Hours	\$595.00		
Training Instructors	\$25.00 / Hour	260 Hours	\$6500.00		
Administrative Assistant	\$12.00 / Hour	10 Hours	\$120.00		
Materials	Allowance	\$1000.00	\$1000.00		
Palm Purchase for Training	\$272.00 / Device	2 Devices	\$544.00	\$544.00	0.00
Total			\$8223.00		

Training Communication Plan:

- Project sponsor will communicate new process and required training need to hospital leadership and staff and to the affiliated physicians
- Training manager will communicate training details and requirements to hospital leadership and affiliated physicians – to include;
 - Physicians and staff are required to attend classes
 - Where to find the Training Schedule
 - How To Complete Registration for Class
 - Report Training Attendance to hospital leadership
 - Report Student Proficiency to hospital leadership

Training Details

- Our Hospital has a dedicated Training Department that is responsible for all hospital related training
- Our Hospital has dedicated training space on campus that will be used for class room training
- Training staff and Training room are available and will be assigned for the duration of the Palm TX Clinical Implementation
- Budgeted training services include: Hands on training provided by the Training Department and creation of end user quick reference documents. Training Department will also create a more in depth online reference that will be available from the hospital intranet page.
- IT will provide the Training Department with 2 Palm TX devices that will be used by the Training department for curriculum development and for instructor use.
- The Project Team Application Specialists will provide training staff with overview of function and detailed review of the expected workflows.
- Final training decisions/workflow diagrams will be communicated to the training instructor by the due date. Decisions made after this date will be added to an Updates Document that will be communicated to end users following training.

- An issues tracking document will be used to record questions/outstanding issues for the project
- Trainers will develop and communicate questions and outstanding issues (content specific) to the project team. Project timelines may be impacted due to unmet due dates or additions to the original scope of the project.
- Training manager will send out a project status report and attend Project Team meetings
- Training scope to include all nursing staff, nursing assistant staff, employed physicians, and Help Desk Staff.
- Palm TX Classroom Training will be mandatory for all hospital users
- Affiliated physicians will be given the option of attending training and then having the software loaded on their personal Palm DX. Use of the software by affiliated physicians will not be required at this time.
- Users will activate their account and be given log on information during their training class
- Staff will be trained during their normal work hours and will be paid for their training time
- Staff not scheduled to work during the training phase will be required to come in on a day off to complete training
- Training Department will offer classes at flexible times to accommodate all shifts
- Nursing Services will supply float staff to cover unit staff while they are in training class
- Training content will be workflow and role based with training format being a combination of lecture, hands on exercise, and practice time
- Each student will complete an online proficiency assessment at the end of class with results noted in the Hospital Learning Management System.
- Make Up Classes will be available on a limited basis
- Post Implementation, Palm TX training will be incorporated into new hire and agency training sessions.
- End user support during implementation will be provided by designated unit staff
- The Training Department will provide additional training for these staff members so they gain additional skills needed to support others
- Post Implementation support will be provided by Help Desk Staff
- The Training Department will provide training for the Help Desk staff which will focus on technical aspects and basic navigation skills

Training Project Timeline:

Date Due	Project Team Owner	Action Item
9/15/2009	Training Manager	Training To Attend Project Kick Off Meeting
9/30/2009	Training Manager	Create Training Project Plan
10/15/2009	Training Manager	Review Proposed Training Project Plan with Project Team
10/31/2009	Project Team Member	Overview of new functionality and workflows for the Training staff
10/31/2009	Project Team / Security	Provide Access to environment to Training Staff
10/31/2009	Training Manager	Training Communication to Management including class registration information
11/30/2009	Training Staff	Training Staff Competent in function and new workflows
11/30/2009	Training Staff	Create Training Class Content and Reference Documents
11/30/2009	Project Team Member	Final training decisions/workflow visios due to Training Manger
12/15/2009	Training Manager	Training Validation (Curriculum and document review) with Project Team and Subject Matter Experts
12/20/2009	Training Staff	Complete any needed revisions to content, documents and training environment

12/31/2009	Unit Leadership	Training Class Registrations Due
1/4/2010	Physicians and Staff	End User Training Begins
1/31/2010	Physicians and Staff	End User Training Completed
2/10/2010	Unit Leadership	Make Up Training Completed
3/1/2010	All Palm TX Users	Implementation Date
3/1/2010	Training Manager	Updated Training Document Distributed if needed
3/10/2010	Training Manager	Transition Training to New Hire, Agency Orientation and Refresher Classes
3/15/2010	Training Manager and Project Team	Training Evaluations Completed with Report to Project Team and Leadership

References

1. **Biomedical Informatics Computer Applications in Health Care and Biomedicine**, Edward Shortliffe chapter 16 paged 578
2. **Basic Training for Trainers** Mary Lippitt, David Miler. 2003
Infoline
ASTD Press
3. **Do's and Don'ts for New Trainers** Cat Sharpe Russo 2005
Infoline, ASTD Press
4. **The Infoline Dictionary of Basic trainer Terms** Jennifer Mitchell,
Cat Russo 2005 Infoline ASTD Press
5. **Spicing Up Classroom Training** Matthea Marquart September
2007 Fundamentals T+D, ASTD Press
6. **Managing Training Projects** Lisa Toenniges Karyn Patterson
December 2005 Infoline, ASTD Press
7. **Teach SMEs to Design Training** Cat Sharpe Russo June 2001
Infoline, ASTD Press
8. **Basics of Stand Up Training**, February 2005 Infoline, ASTD
Press
9. **The Year 2013 ARDDIE Is In ADDIE Is Out** , Benjamin E Ruark
T+D July 2008 ASTD Press