

Applying Business Process Analysis to Define EMR Requirements

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September 22, 2009

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The Public Health Informatics Institute is the national program office.**



Collaborative Requirements Development Methodology

Business Process Analysis

think

How do we do our work now?

- Define goals and objectives
- Model context of work
- Identify business rules
- Describe tasks and workflow
- Identify common task sets

Business Process Redesign

rethink

How should we do our work?

- Examine tasks and workflow
- Identify inefficiencies
- Identify efficiencies with repeatable processes
- Refine business processes and business rules
- Remodel context of work
- Restructure tasks and workflow

Requirements Definition

describe

How can an information system support our work?

- Define specific tasks to be performed for optimized business processes
- Describe the implementation of business rules
- Describe in words and graphics how an information system must be structured
- Determine scope of next phase of activities



Overview of HIS Adoption Project & EMR/Practice Management Project

- Southern Piedmont Partnership for Public Health (SPPPH) Common Ground Goal
 - Have public health electronically communicate with HIEs, community health care partners and consumers
- Why we did this?
 - EMR is a prerequisite to interface with a HIE
 - Other Common Ground project is planning a regional HIE (SoPHIE = Southern Piedmont Health Information Exchange)
 - NC public health have a paper-based health record system
 - Develop efficient and effective best practice workflows for clinic processes, case management and billing
 - New state-wide clinic management system, HIS, is not a comprehensive EMR/practice management system
 - EMR requires significant business/service process changes from a paper-based system



Overview of HIS Adoption Project & EMR/Practice Management Project

- Project Objectives
 - Develop requirements for evaluating EMR/Practice Management systems and electronic exchange of medical record data
 - Evaluate pilot version of HIS against the system and functional requirements to make recommendations of future enhancements and functionality to NC DPH
 - 85 local health departments in NC have option to use HIS or other solution – analysis benefits many health departments
- Two projects evolved:
 - HIS Adoption Project
 - EMR/Practice Management Evaluation Project



Overview of HIS Adoption Project

- Developed business process matrix, context diagrams, and task flow diagrams from March - October 2008
 - Collaborative project with 35 subject matter experts (SMES) from 7 local health departments and NC Department of Public Health
 - Held over 18 collaborative workgroup meetings
- BPA & BPR of 15 business processes:
 - Child Health
 - Family Planning
 - Billing
 - Registration/Checkout
- Developed HIS IT recommendations



Overview of EMR/Practice Management Evaluation Project

- Incorporated the HIS Adoption business process analysis work into the EMR/Practice Management Evaluation project
- Collaborated with 45 SME's from 3 local health departments:
 - Cabarrus Health Alliance
 - Iredell County Health Department
 - Mecklenburg County Health Department)



Overview of EMR/Practice Management Evaluation Project

- Analyzed other areas that would be affected by a new EMR system from September 2008 – January 2009
 - Communicable Disease (CD)
 - Intensive Home Visiting (IHV)
 - Lab
 - Maternal Health
 - Maternal Care Coordination/Child Services Coordination (MCC/CSC)
- Held over 30 workgroup meetings
- Redesigned 47 business processes



Example of BPA/BPR Work

- Family Planning BP #1 Handouts
 - Business Process Matrix
 - Context Diagram
 - Task Flow Diagrams
 - Redesign Task Flow Diagram
 - Redesign Task Flow Diagram with HIS Menu Paths



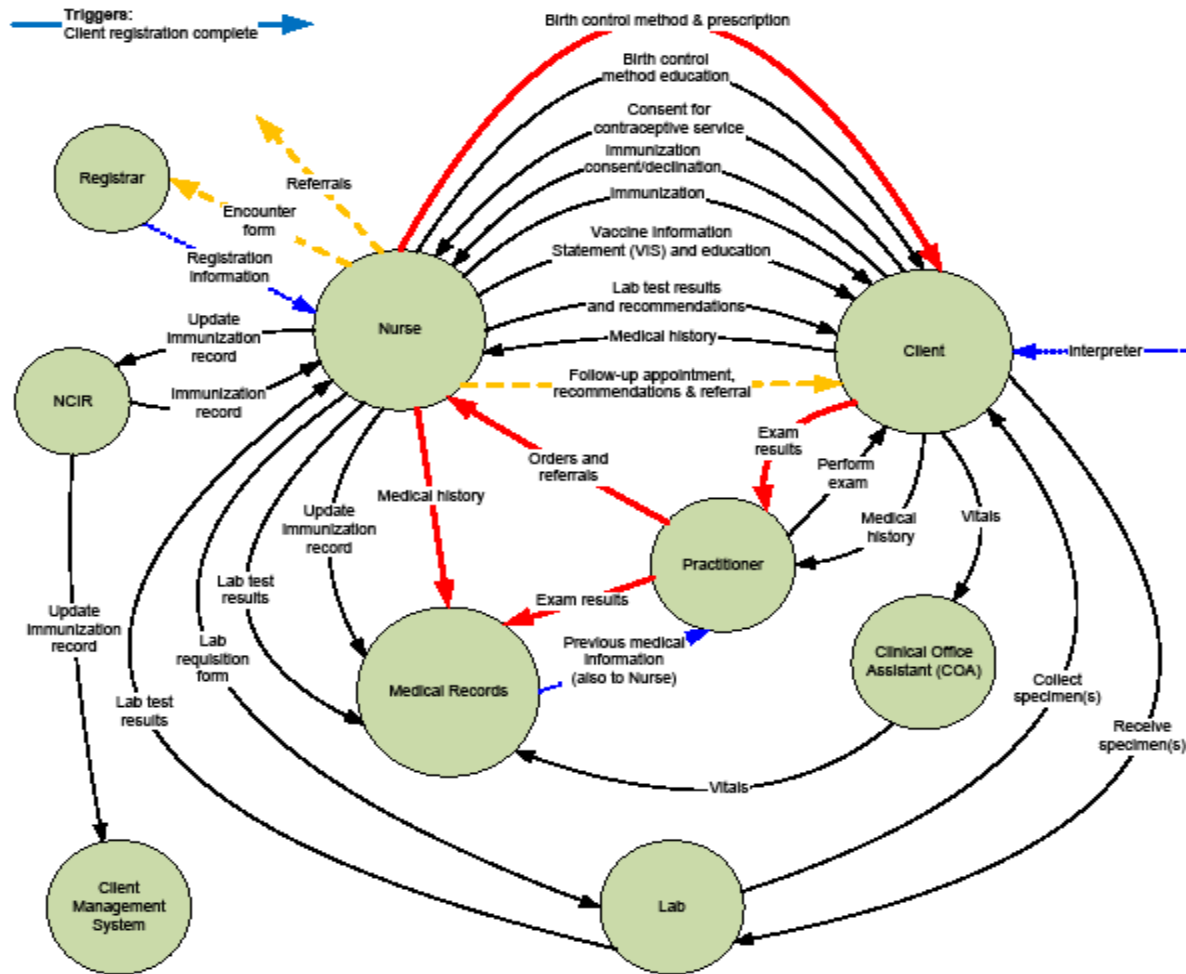
Business Process Matrix

Workgroup	BPI	Business Process Name	Goal	Objective	Business Rules	Triggers	Task Sets	Inputs	Outputs	Outcomes
29 Family Planning	3	Client visit (new, annual, problem -male or female)	Provide appropriate family planning services which meet the client's needs	<ul style="list-style-type: none"> Complete medical history Medical exam Provide education Provide a method of birth control, other reproductive information, and/or referral 	<ul style="list-style-type: none"> HIPAA Title X (Family Planning Federal Guidelines) NC Administrative rules Federal Poverty Guidelines Local Health Department policies and procedures Title V (language assistance) NC Board of Nursing Rules NC Board of Pharmacy Title VI (Civil Rights Act) 	* Client registration complete	<ol style="list-style-type: none"> Greet client Take vitals (height, weight, blood pressure), and calculate BMI Complete patient history form Continue Interview Complete consent forms Complete required forms Assess immunization status/provide immunizations if needed Exam room setup/preparation Provide method education Review history, ask/answer questions Conduct exam *Perform lab tests (*order of lab test task set varies) *Exit Interview (*order of exit interview task set varies) 13A. Share exam results 13B. Provide education 13C. Dispense medication 13D. Make necessary referrals 14. Complete encounter form 	<ul style="list-style-type: none"> Registration information Exam supplies Interpreter Previous medical information 	<ul style="list-style-type: none"> Referrals Follow-up appointment recommendation Encounter form 	<ul style="list-style-type: none"> Complete medical history Medical exam Provide education Provide a method of birth control and other reproductive information



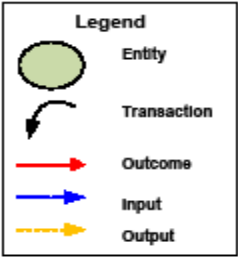
Context Diagram

Family Planning BP #1 – Client Visit (New, Annual or Problem Visit - Male or Female) - Context Diagram – page 1 - 1/12/2009



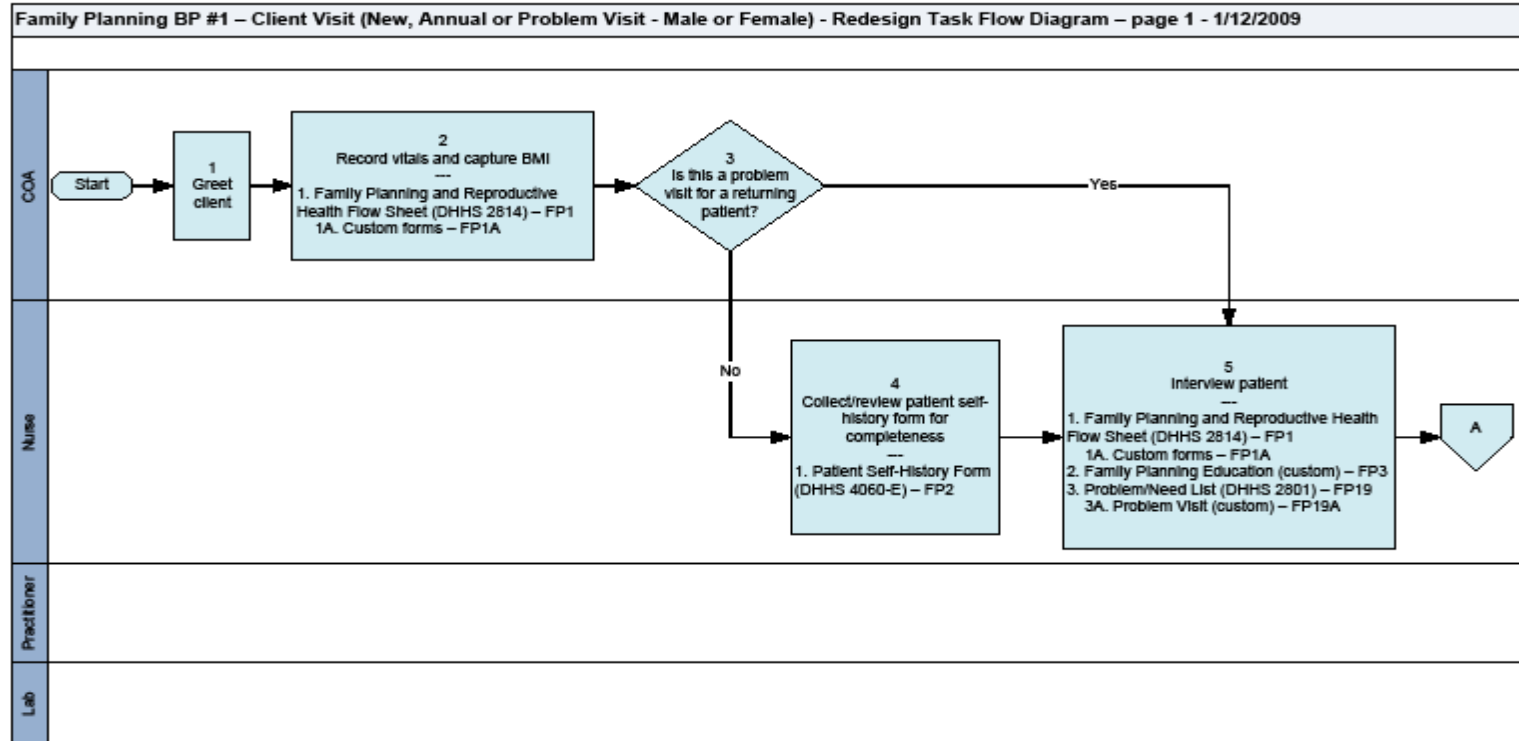
Notes:

- Interpreter may or may not be needed.
- COA may not be used in all health departments. If no COA, transactions happen between Nurse and Client.





Task Flow Diagram

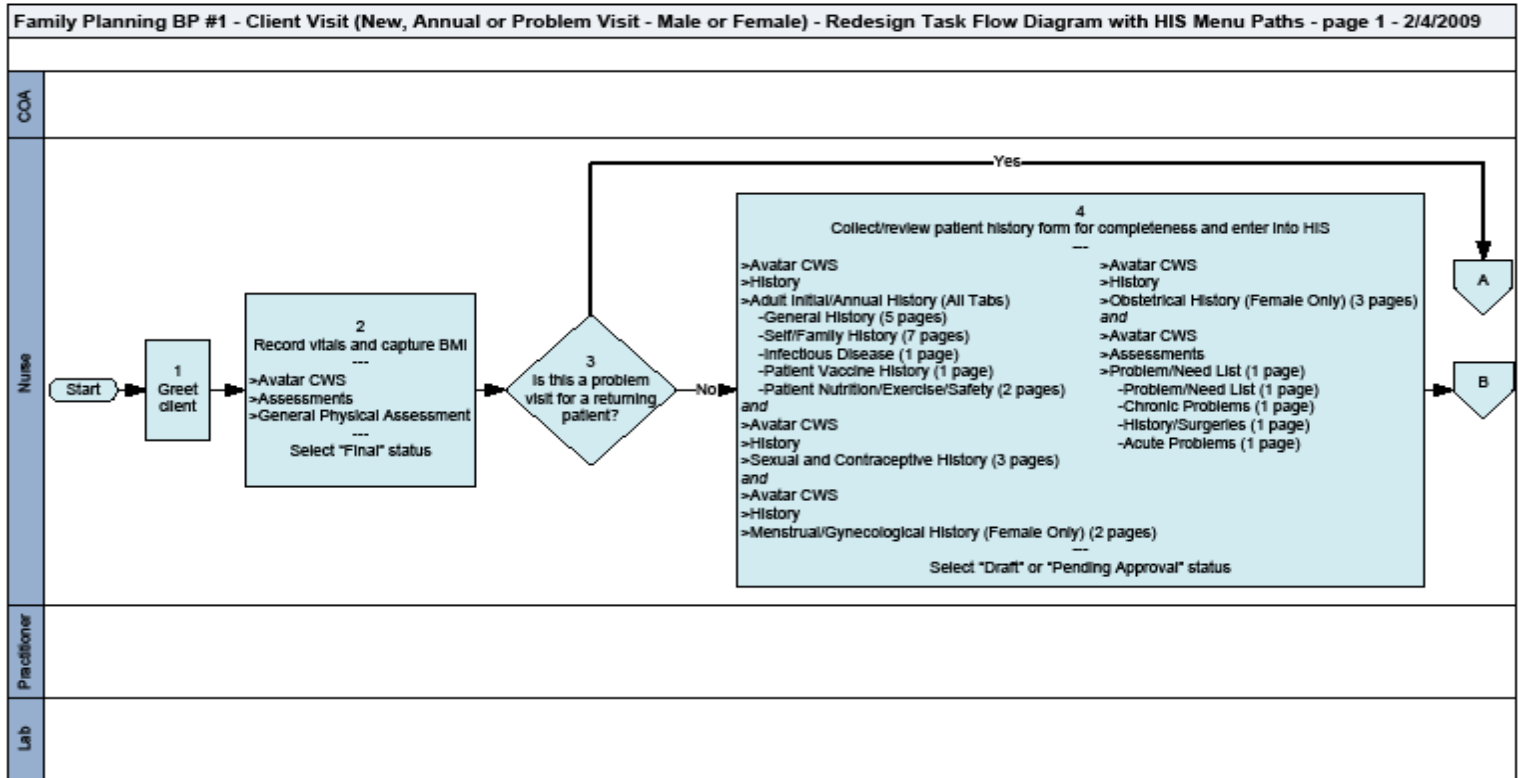


- Activity Details**
- COA (Clinical Office Assistant) swim lane represents Medical Office Assistant (MOA), Licensed Practical Nurse (LPN) or Certified Nurse Assistant (CNA) job titles.
 - Tasks that have forms currently associated with the task have --- that separate two sections of text. The top section is the task, the bottom section has the forms. The forms have a reference number after them, i.e. FP1. The number refers to a scanned version of the form.
 - In some local health departments, labs are currently drawn per standing order prior to an exam. This is not documented here.
 - Based on HealthMetrics recommendations moved education component of the visit to the exit interview section to hopefully improve patient education retention.
 - Based on HealthMetrics recommendations the nurse should not "Interview the patient" (task #5), in order to eliminate the duplication of effort in the history review by having only the practitioner review/amend the history. The nurse just verifies that all information has been completed.





Task Flow Diagram



- Activity Details**
- COA (Clinical Office Assistant) swim lane represents Medical Office Assistant (MOA), Licensed Practical Nurse (LPN) or Certified Nurse Assistant (CNA) job titles.
 - Tasks that are specific to HIS have --- that separate two sections of text. The top section is the task, the bottom section is the HIS screen path. If there is a second ---, the information in the third section is specific information regarding the functionality in HIS on the screen.
 - Tasks that have forms currently associated with the task have --- that separate two sections of text. The top section is the task, the bottom section has the forms. The forms have a reference number after them, i.e. FP1. The number refers to a scanned version of the form.
 - Based on HealthMetrics recommendations moved education component of the visit to the exit interview section to hopefully improve patient education retention.





Overview of EMR/Practice Management Evaluation Project

- Requirements definition phase - January - June 2009
 - Produced functional and technical requirements
 - Held 32 collaborative workgroup meetings with 45 SME's
 - 680 requirements defined
 - Over 4000 data fields determined



Overview of EMR/Practice Management Evaluation Project

- Software evaluation phase – July - August 2009
 - Developed 6 sales demo use cases
 - Developed evaluation tools for SME's to score each vendor solution
 - Each health department scored independently
 - Scoring included determining weighted averages for each workgroup area prior to the evaluation process beginning
 - Each vendor also completed the evaluation to allow us to compare our evaluation results with their responses
 - Evaluated 3 vendor solutions
 - Netsmart Technologies Insight (Public Health focus)
 - Cerner PowerWorks (Provider/Hospital focus)
 - HIS (State's clinical system)
 - Customer site visits



Overview of EMR/Practice Management Evaluation Project

- Recommendation – September 2009
 - Recommend an EMR/Practice Management system(s) to senior management (CHA deadline due to new building construction)
- Share work with other health departments in NC and nationally



Lessons Learned

- SMEs, the people actually doing the work is Key!
- Need workgroup members that are SME's of the business process – high level managers are typically not the right SME's
- Need to have a project that the team has interest in and sees the value in the time spent
- Need a facilitator and/or analyst to lead project even if staff is trained in concepts
- Workgroup members who are best suited for this type of work are those that are detail-oriented, perfectionist, etc.



Lessons Learned

- Will require significant time and resources, but the process is the right thing to do especially for large IT projects
- Start with a project that has a lot of interest to teach importance of process
- Written project charter of what is expected from team members would help when working with multiple agencies that you don't have direct influence over



Lessons Learned

- Utilize task flow diagram structure to aid in transitioning from a paper-driven system to an electronic medical record
 - Created task flow diagram versions that referenced the forms used for each task which later aided in defining requirements and data fields
 - Created task flow diagram versions that included HIS menu paths to aid in training new users



Benefits of PHII's Collaborative Requirements Development Methodology

- Better understanding of processes, especially those that IT will support
- Opportunity to learn from others' approaches and improve processes
- Documentation of processes facilitates requirements development
- Documentation of business processes is a great learning tool even without an IT project
- Build support for positive change and quality improvement
- By combining these techniques with other quality improvement methods (i.e. IHI) allows you to refine business processes in your agency from all sides



Information on CD

- Overview of HIS Adoption & EMR/PM Evaluation Projects
- 47 Business Processes
 - Business Process Matrix – 1 Excel spreadsheet for all
 - Context Diagrams – Visio and PDF version of each
 - Task Flow Diagrams – Visio and PDF version of each
 - CD, IHV, Lab, MCC/CSC, and Maternal Health - Two task flow versions – one with forms and one without forms
 - Child Health, Family Planning, Billing, & Registration/Checkout have multiple task flow versions due to the work done with the HIS workgroups
 - BPA with forms (if applicable)
 - BPR with forms (if applicable)
 - BPR with HIS menu paths
 - BPR with no forms
 - All forms currently used in business processes are scanned



Information on CD

- Demo Use Cases
- Requirements Table – Evaluator Version – Excel and PDF version
- Data Fields Table – Evaluator Version – Excel and PDF version



Reference Materials

- These projects are described in a chapter of a book that was just released, *Managing the Public Health Enterprise*. “Business Process Improvement: Working Smarter Not Harder”



Questions?

