
NC Public Health IT Advances in 2009 to Improve Public Health Services

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Overview

- Background
 - Factors driving HIT adoption in local public health agencies
 - Need for business process management (BPM) skills among local public health leaders
 - Short History of work in this area prior to 2009
 - 2005/6 - Public Health MIS Assessments
 - 2007 - South Central Common Ground BPM training and initial usage
 - 2007 - Southern Piedmont Common Ground – BPM training and initial usage – Phase 1
 - 2007 - Environmental Health GIS Program – Phase 1
 - 2008– NC TeleHealth Network Planning
 - Progress in 2009 and Prospects
 - The Common Ground Program – Phase 2 – HIS/EMR Adoption Planning
 - SoPHIE – a Person-Oriented Health Information Exchange Planning to Pilot Selection
 - NC TeleHealth Network- planning to implementation
 - NCPHIT – a high-level planning process for public health IT-centric activities
 - NC PH ITES – an Extension Service Proposal for public health
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Basis for focusing on health IT adoption in local public health agencies.

- 2005/6 - MIS Assessments of 32 county public health agencies in northeastern NC and south central NC were carried out to assess the status, opportunities, and challenges associated with the adoption of health IT by these agencies.
 - The assessment process focused on eliciting and organizing the views of local public health agency directors and managers in these counties.
 - Three key findings in these assessments are:
 - There is wide agreement that there is significant opportunity to improve the contribution that health IT makes to local public health agencies missions.
 - Fostering/improving business process development skills among local public health leaders is a key next step to useful health IT adoption in these areas. This will create a way for public health leaders to plan how HIT can support health-improving operations.
 - There are significant advantages to collaborating among counties in a region on HIT initiatives. e.g. scale of purchase; interoperation of systems across counties; more options for operating regional programs.
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Key factors related to health IT adoption in local public health agencies

- Key Factors promoting health IT adoption:
 - Opportunity to improve the public's health
 - Opportunity to improve efficiency, effectiveness, and safety of public health services (in clinics and in bio-event preparedness); especially to meet expectations of funding agents.
 - Information-intensive nature of public health mission.
 - Regional collaboration potential resulting from the NC Public Health Incubator Collaboratives
 - New resources in this area (especially from funding from ARRA and the NC HIS project)
 - Meaningful Use of EHRs/HIE requirements in the ARRA
 - Near-term availability of a high-speed reliable broadband network for public health agencies (and free clinics).
 - Growing commercial product/service base suitable for IT-centric public health needs.
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Key factors related to health IT adoption in local public health agencies

- Key Factors inhibiting health IT adoption
 - Need for local public health leaders and staff to add skills that enable useful HIT adoption. (i.e. training and integration of new skills into practice)
 - Funding – many projects require a funding model that includes significant capital investment and a long term support mechanism.
 - Very limited current IT support/facilities
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Summary of Business Process Related Work through 2008

Why understanding business process in public health is essential for useful health IT adoption

- A closer look at the need for training revealed that most local public health leaders (i.e. directors and managers) don't have a method for seeing how their enterprises are working now or to explore how operations might usefully change.
 - Without such a method, managing existing processes and seeing how to usefully improve processes is difficult.
 - Business Process Analysis (BPA) and Business Process Redesign (BPR) methods provide a way to understand and design useful changes to business processes.
 - The basic need for business process analysis skills is:
 - the first skill needed in an IT adoption project
 - the hardest to outsource
 - arguably the most important need to fulfill
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First steps toward acquiring and using business process development skills in local health departments in NC.

- Efforts have focused around regional public health collaboratives in NC. Two are discussed here:
 - Southern Piedmont NC Partnership for Public Health
 - South Central NC Partnership for Public Health.
 - Involvement/support of the NC Institute for Public Health (the outreach arm of the UNC School of Public Health)
 - Projects funded by Robert Wood Johnson Foundation Common Ground Program for two groups in NC.
 - The Common Ground program (supported by the Public Health Informatics Institute) focuses on training and support of public health leaders in the use of business process development tools to aid in health IT adoption. Planning for information systems for direct services to the public (a.k.a. a person-oriented health information exchange) included.
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South Central NC Partnership for Public Health: Common Ground Project

- SCNCPPH received a RWJF Common Ground Informatics Capacity Grant of \$30K for a 15-month project- starting in December 2006.
- The project focused on training public health leaders (i.e. Directors and some senior staff) in the Partnership in the use of formal business process analysis and reengineering tools.
- The initial use of the tools was in the support of improvements in Environmental Health as a regional project and one or two business process redesign projects selected by each participant.
- The Environmental Health project was an extension of work that was started in the Northeastern NC Partnership for Public Health and has grown to include the South Central and Western Partnerships. It predates Common Ground.
- The training in business process analysis began with a session led by the PHII for the key grantees (Cumberland, Bladen, Sampson, and the NC Institute for Public Health).
- Other SCNCPPH member agency (7 total) Directors and senior staff trained and started initial usage of the skills in February 2008.

SCNCPPH Counties: Anson, Bladen, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Randolph, Richmond, Robeson, Sampson, and Scotland



Environmental Health business process redesign 2007: identifying the opportunity

- The Environmental Health Project in 2007 involved the Northeastern Partnership, the South Central Partnership and Western Partnerships.
 - It provided a concrete example of the use of formal business process analysis and reengineering at use in public health in NC.
 - Key EH business functions affected: Food and Lodging Inspections; Septic Tank Management , and Well Management (water)
 - The incorporation of location/routing information via Geographic Information Systems (GIS) into tablet PCs in carrying out the functions was considered essential to improving efficiency and effectiveness. Also allowed for mapping water contaminant flow.
 - GIS is an example of a technological innovation enabling a significant improvement in business process.
 - BPM techniques supported the collaboration by:
 - Providing a common language from which a common approach was derived.
 - Resulted in a shared data model that supported cross-region usage and anticipated diffusion across the state.
 - Supporting an incentive to the efficiency of a collaborative approach.
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Southern Piedmont Partnership – Phase 2 (2008) Common Ground Activities

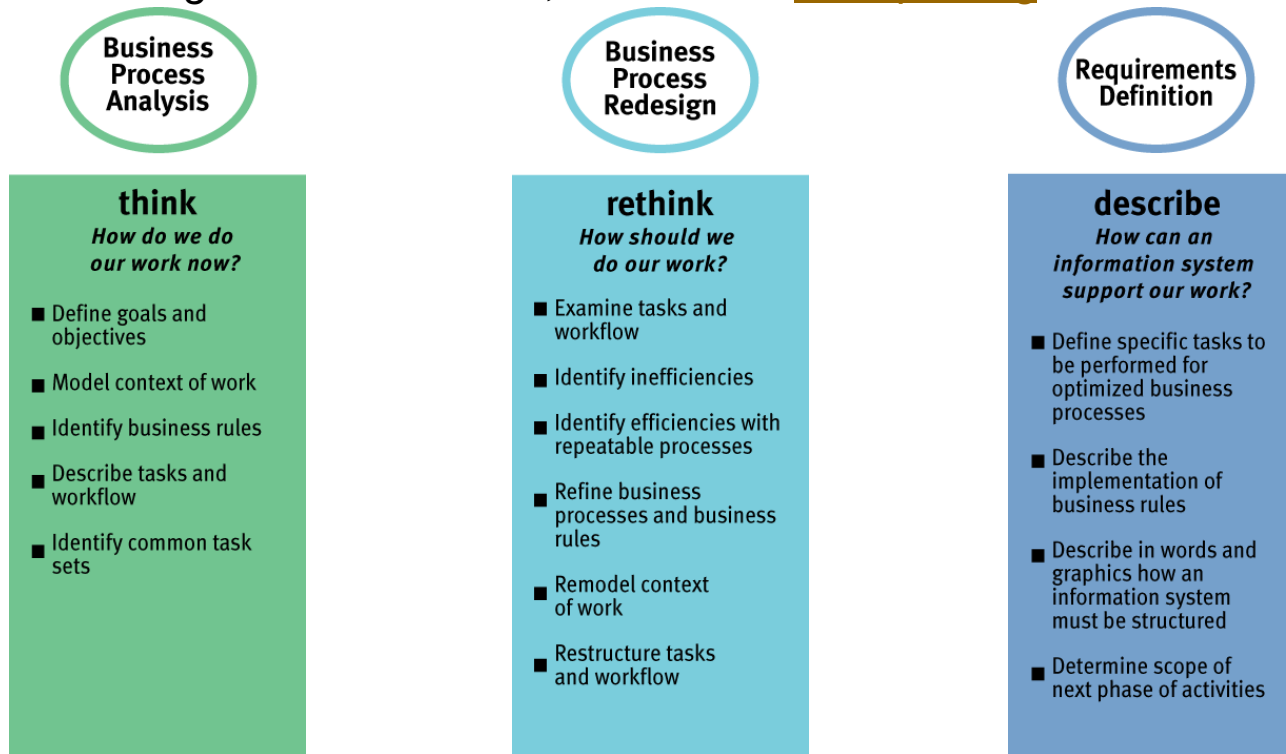
- Led by Cabarrus Health Alliance
- Key activities:
 - 1) Complete collaboration with a national group on model public health business processes.
 - 2) Do business process analysis of virtually all major local public health agency functions in NC with a representative group of 10 agencies
 - 3) Start business process redesign and requirements definition to support HIS adoption/customization and acquisition of other EMRs for public health.



Learning the Lingo: Business Process Development

Three phases of business process development model

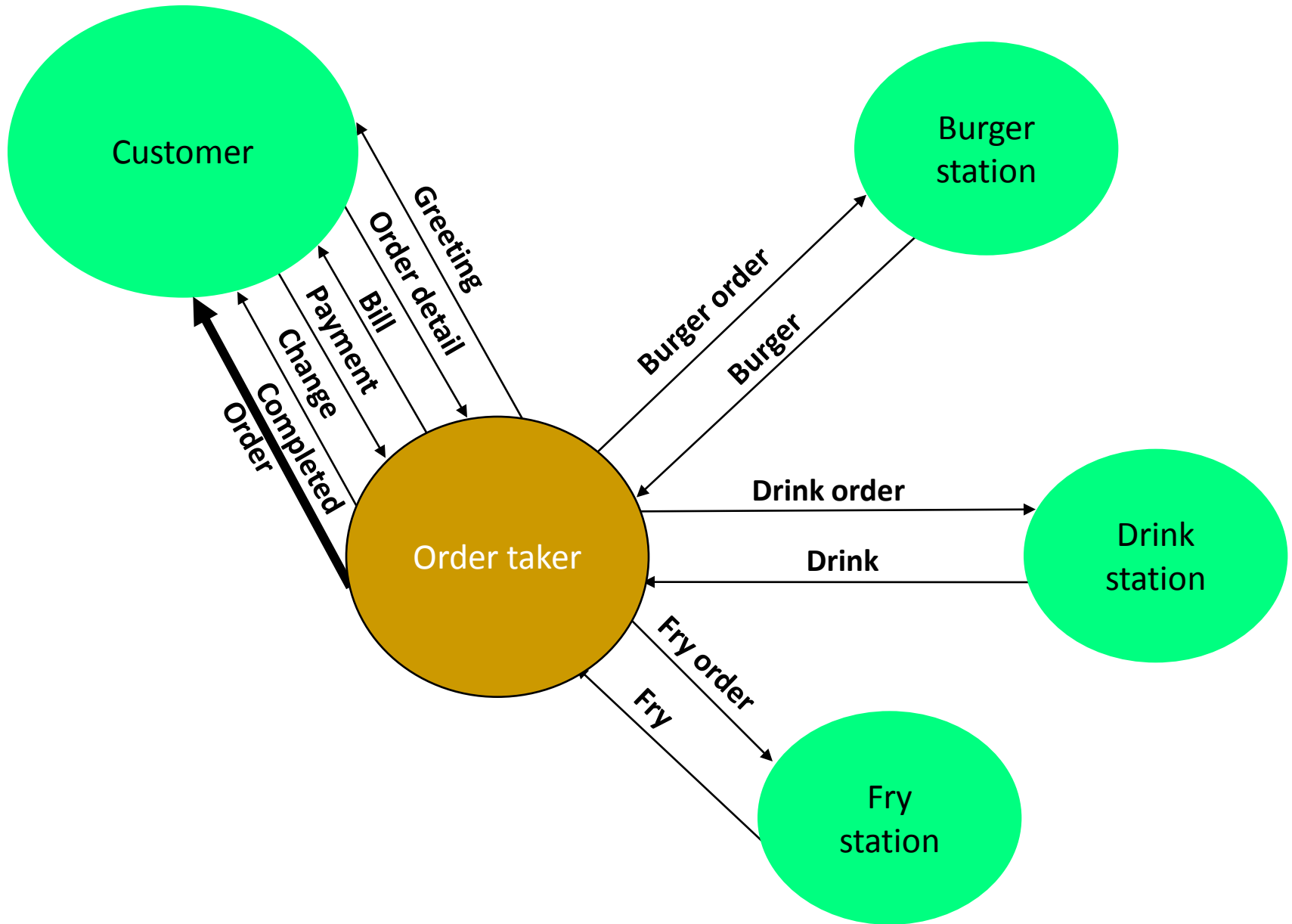
The tools and information about business process analysis, presented below and in the following slides are adapted from the methodology developed by the Public Health Informatics Institute (PHII), national program office for Common Ground. From the publication: *Taking Care of Business*, available at www.phii.org



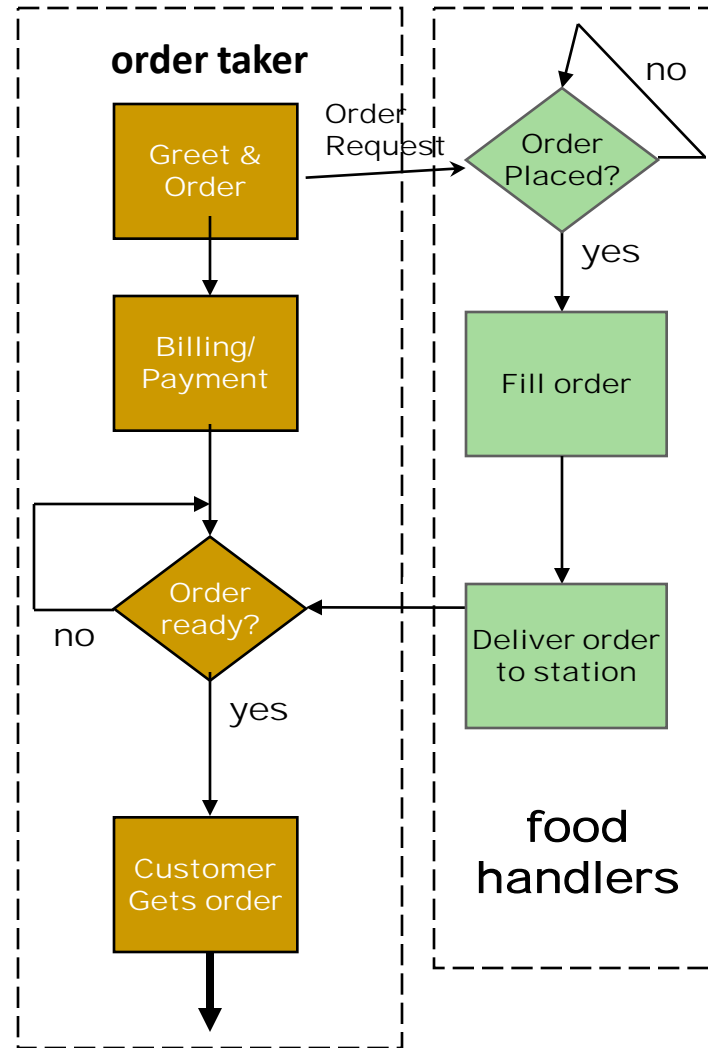
Business Process Analysis Tools

- Combined use of three tools:
 - Context Diagram – focuses on who is involved in the business process and how they interact.
 - Task flow Diagram – focuses on the sequence of steps needed to carry out the process.
 - Business Process Matrix – focuses on higher-level attributes of a collection of business processes (e.g. goals, objectives, business rules).
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Fast Food: Order Fulfillment – Context Diagram



Fast Food: Order Fulfillment - Task Flow Diagram



Fast Food: Order Fulfillment - Business Process Matrix

Goal	Objective	Business Rules	Trigger(s)	Task Set	Inputs	Outputs	(Measurable) Outcomes
Timely provision of food and service to the customer at the best value.	Accurately process food order for and receive payment from drive-through customers in a minimal amount of time.	FDA standards for food handling; cashier does not handle food; cashier provides greeting and acts as point of contact for all food stations.	Customer arrives at drive-through station.	Greet customer; take order; process order; bill customer and receive payment; receive and deliver order to customer.	Food and beverage inventory; Inventory of paper goods (bags, straws, napkins).	Inventory orders; sales activity reports; deposits; incident reports.	Payments received, timeliness of order fulfillment; number of customer complaints; incident reports.

Key Points: Business Process Redesign

- Redesign, especially collaborative redesign, of business processes has the documents and experiences from the BPA work as its primary input.
- Redesign's primary result is a new set of documents and consensus and rationale for improving a business process.

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

Key Points: (Information System) Requirements Definition

- Note: Not every business process change results in new or changed information systems, but many desired changes do require significant IT elements. For those that do....
- Requirements definition describes how an information system can support the redesigned process.
- The outputs from Redesign are the primary inputs to Requirements Definition.
- The primary outputs of Requirements Definition are the definition documents and an actionable consensus about how to use IT to improve the business process.
- This sets the stage for logical system design, funding discussions, RFP development, vendor comparisons, and other steps to implement the desired change in business process.

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

2009- Progress and Prospects

High-level CommonGround project flow (3 years, starting in late 2006)

- Nationally:
 - Participation in the national Common Ground group developing model chronic disease business processes and requirements for public health information systems
 - Locally:
 - Train partners in business process analysis (BPA), business process redesign (BPR) and requirements definition (RD).
 - Support in group project of analyzing heart disease and stroke prevention business processes.
 - Evaluate current clinic business processes within local public health and how business process is affected by (and affects) the new HIS
 - Collaborate with regional partners on EMR and practice management BPA, BPR, and RD.
 - Development of a set of business outlines, technology architecture, and pilot plan for a person-oriented health information exchange (POHIE).
 - Development of long-term plan for reengineering other public health functions within and among the partners.
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National Common Ground Public Health Business Process Model - 2009

- Development of “current” key business processes in state and local health departments. Key drivers in the work:
 - Sorting out process language and level of process
 - State vs. local perspective on processes
 - HHIS alignment
 - Development of Business Process Matrix, Task Flow and Context Diagrams for chronic disease prevention processes:
 - Data collection, management, process, analyze and interpret data
 - Conduct community health assessment
 - Develop strategic plan
 - Deliver programs and services
 - Develop clinical guidelines to improve health
 - Develop and perform public health intervention
 - Link individuals to services
 - Evaluate disease management programs
 - Conduct epidemiological research
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Acquiring BPM skills in local public health agencies in NC - 2009

- Expansion to training related to HIS/EMR Adoption:
 - Rationale: HIS/EMR Adoption is a near-term high priority project that involves business process redesign for most local public health agencies in NC. Opportunity to develop BP best practices related to HIS usage.
 - Groups: Child Health, Family Planning, Billing
 - Process: Face-to-face workshops/training, interim calls/web conferences, online collaborative space.
 - Coordination: need to time well with HIS roll out; close coordination with DPH
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Using BPM skills in local public health agencies in NC - 2009

- The group of 10 NC public health agencies completed:
 - A business process analysis of virtually all local public health agency functions in NC
 - A business process redesign both to support HIS adoption and support additional IT-centric public health needs
 - A set of IT system requirements definitions to support the redesigned processes.
 - Benchmarking of three systems against these requirements. (3 counties participated in this portion - Cabarrus, Iredell, Mecklenburg)
 - Prospects:
 - This work and the availability of many BPM-skilled practitioners positions NC local public health to do a much better job of meeting the opportunities and challenges of meaningful EHR/HIE adoption, responding to emerging QI needs, readiness to work with an IT Extension Service, and improved ability to compete for funds and use them effectively in this area.
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SoPHIE Overview

- SoPHIE is a type of electronic individual health information exchange and storage facility that has the following key characteristics:
 - **Patient flow control:** provides for control of information exchange and access by the person who is the subject of the information (e.g. in the clinical context - the patient)
 - **Longitudinal/comprehensive:** supports easy collection of individual health information across professional providers (under the individual's control)
 - **Involvement in health and care:** supports patient and lay caregiver involvement in improving/maintaining health
 - **Public good uses:** supports traditional and new secondary uses of health information (with individual permission) (e.g. medical research, health services planning)
 - **Part of the infosphere:** can add value by coexisting and interoperating with entity-oriented exchange processes (e.g. exchanges of individual health information among providers)
 - **Consumer-focused:** focuses each healthcare enterprise on its relationship with its customers/patients.

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- See a read-only version of the project's wiki at <https://www.dtmi.duke.edu/wiki/display/pohie/Home>

SoPHIE Planning Group

- Representatives from:
 - Cabarrus Health Alliance
 - Division of Medical Assistance
 - Cabarrus Family Medicine
 - NC Association of Free Clinics
 - Community Care of NC
 - Duke Health System (DTMI, and Nursing)
 - UNC (NC Institute for Public Health , Renaissance Computing Initiative, and School of Information and Library Science)
 - NCHICA – CACHI representative plus others
 - NCSU (NC Cooperative Extension, Public Admin)
 - First Health of the Carolinas
 - NC Nurses Association
 - Independent Consumer Advocates
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SoPHIE Planning Process Outline

✓ 2008 -

✓ Initiate planning process

- ✓ Obtain planning resources,
- ✓ Form the planning group,
- ✓ Develop planning phases

■ Develop and prioritize value propositions (VPs)

- ✓ Draft the value propositions (VPs), setup collaboration infrastructure
- ☑ Review and prioritize the VPs into 3 generational groups
 - Refine VPs if needed
 - to fit into the road map.
 - to select key business/service processes

■ Outline business/service plan(s)

- ☑ Define elements of the business/service plan outline.
- ☑ For selected generation 1 VPs.

✓ 2009 -

- ✓ To reveal what issues will be involved with implementing the selected VPs.
- ✓ Key parties, governance issues/answers, resourcing, sustainability, coordination with others in the infosphere

■ Define key business/service processes

- ✓ Some aspects of each business/service plan will involve individuals and businesses carrying out processes.
- ✓ Explore those processes that will be key to each business/service plan to resolve how they would work.

■ Define approach to key technical issues

- ✓ There are several common technical issues that affect most processes and are best managed similarly across processes (e.g. person authentication (for access to information), patient/provider identification, credibility/integrity of information))
- ✓ Defining an approach to these key technical issues will set the stage for acquiring and using technology to support the processes.

■ Create road map to implementation

- ✓ There are several unknowns about how/when various opportunities to implement the business/service plans will arise.
- ✓ The implementation road map is intended to guide us in taking steps and adjusting the route to implementation depending on how these opportunities develop.

■ Select Pilot Project

Top value propositions for three generations of SoPHIE applications

- **Generation 1:**
 - Mother & Child (Medical Home Model)
 - Better Medication Management
 - Managing blood pressure better with PHR-based BP trend monitoring
 - Chronic diseases management activities
- **Generation 2:**
 - Communication with doctor, nurse, case worker through PHR, cell phone, other
 - Electronic lab orders and results (via HIE)
 - Electronic Referrals (via HIE/PHR)
 - on-line appointment scheduling (via PHR/EHR – HIE)
- **Generation 3: (w dups from gen 2 removed)**
 - Action-Oriented PHR
 - Wellness Activities
 - Communicable Disease Reporting
 - Schools and Health
- ~~Note: Some VPs were framed in a way that part of their value is achieved by other VPs (e.g. Managing BP partly achieves value of Action-Oriented PHR)~~

Current SoPHIE Intersecting Projects

- **Duke MURDOCK study** – longitudinal patient-centered research registry for Cabarrus area community. (ala Framingham study)
 - **Mother and Child Health Initiative/Medical Home Project** – support reductions in infant mortality/morbidity.
 - **UNC and Duke – CTSA (Clinical and Translational Science Awards)**- speeding translation of research findings into care and engage the public in clinical research.
 - **Various PHR initiatives** in the region.
 - **NC TeleHealth Network**
 - **NC HIE**
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SoPHIE Pilot Prospects

- **Concept: A community health portal with a person-oriented section devoted to individual health information sharing and use by the public, health care providers, and others- using POHIE principles**
 - **The pilot should be of value itself and set the stage for improvements as the viable opportunities in this space grow.**
 - **The pilot should be accomplishable within one year.**
 - **There is some funding to support an initial pilot.**
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Some SoPHIE Pilot Partner Prospects: WorldDoc

- **From initial pass at data collection:**
 - <https://www.worlddoc.com/>
 - Provides software to support PHR functions of the type outlined in the SoPHIE value propositions.
 - Services that engage the public and that support community-centered efforts.
 - Low entry costs with sustainability model
 - Support for a care team including lay providers, health coaches, and professional providers.
 - Health info library.
 - De jure and defacto standards for interchange (e.g. CCD, HealthVault)
 - Selected by similar projects (e.g. Healthy Ocala)
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Some SoPHIE Pilot Partners Prospects: Cerner Healthe Intelligence Services

- ❑ **Provides software to support PHR functions of the type outlined in the SoPHIE value propositions. (A fairly rich set)**
 - ❑ **Services that engage the public and that support community-centered efforts.**
 - ❑ **Financing: up front costs for interfaces/customization plus PMPM for ongoing maintenance; willingness to share risk with customers.**
 - ❑ **Support for a care team including lay providers, health coaches, and professional providers. Health info library.**
 - ❑ **Option for population health providers to get de-identified info (with consumer permission)**
 - ❑ **Wide range of interfaces for HIE with general willingness to support more**
 - ❑ **Selected for projects led by state Medicaid agencies (e.g. OK, Tx) and HIEs/RHIOs.**
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Some SoPHIE Pilot Partners Prospects: Network of Care

- ❑ <http://networkofcare.org/home.cfm>
- ❑ Provides software/schema to support private health-related records (mostly unstructured data) that consumer can share with others.
- ❑ Focus on health-related advocacy by and for various groups – (e.g. aging councils, public health agencies, mental health, people with disabilities, veterans)
- ❑ Multi-language support with site usage support for those with disabilities (e.g. text only for the blind)
- ❑ Health library, services directory
- ❑ Services that engage the public and that support community-centered efforts.
- ❑ Financing: Paid by sponsoring group (e.g. public health agency); low cost
- ❑ HL7 compliance for data sharing
- ❑ Selected for projects led by many health advocates – several in NC. (Edgecombe, Halifax, Nash, Northampton, Wilson, Franklin, Granville, Halifax, Vance and Warren, Durham)

SoPHIE Pilot Next Steps

- ❑ **Do second level exploration of service/product offerings; potentially others will come forward also.**
 - ❑ **Choose a partner**
 - ❑ **Establish pilot project specific objectives.**
 - ❑ **Execute the project- including evaluation against objectives.**
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NCTN : Need for Support for Business Processes Using Broadband-based Information Networks

- **Network-Reliant BPs:** Many processes depend on use of information facilities spread across more than one site. Some involve multiple business partners.
 - **For example:** HIS, HAN, SoPHIE, Remote educations, telemedicine, disaster response, ASP EMRs, general HIE access
 - **Need for Robustness and Speed:** These BPs need physical networks that have reliability and speed commensurate with their needs (and greater than those generally in place today).
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NC TeleHealth Network (NCTN)- 2009

- NCTN – an organizing concept for a set of facilities to meet these needs – notably for local public health agencies, free clinics, hospitals, and medical practices.
 - Funded 85% by the FCC's Rural Health Care Pilot Program.
 - Key design points:
 - Support high-priority applications (notably HIS) need for bandwidth and (especially) reliability
 - Support disaster response operations
 - Support tele-education and
 - Allow technical support for more telemedicine applications
 - Three phases:
 - NCTN-PH – for public health agencies in NC and free clinics; in RFP vetting stage.
 - NCTN-H - for hospitals in NC; funding for project in hand (\$6.1m) from merger of all four NC RHCPP projects; Program management funding pending.
 - NCTN-AMB – for medical practices in NC – in need of funding – potential in NTIA BTOP program.
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NCPHIT – NC Public Health IT Planning

- A project to create a general planning function for local public health activities in NC that are IT-centric.
 - Led by NCAALHD, DPH, NCIPH.
 - In early stages of organizing.
 - Expect it to provide local public health leadership for ARRA-related efforts, HIE integration, meaningful use of EHRs, extension service, QI efforts.
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NC Public Health IT Extension Service

- A planning (and eventual) service function for IT-centric support for local public health agencies (training, consulting, etc).
 - Led by the NCIPH.
 - Cooperating with NCAHEC and others as part of overall application of ARRA – Regional Extension Service application.
 - In early stages of development.
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Q&A

- Thanks!
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