National Program of Cancer Registries - Modeling Electronic Reporting Project (NPCR-MERP)

PHIN 2005 Conference

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May 2005

Role of Federal Government in Health Data Standards

The needed intervention is not for the government to set the standards, but rather for them to convene the key players and to mediate.

Donald W. Simborg

J Am Med Informatics Assoc

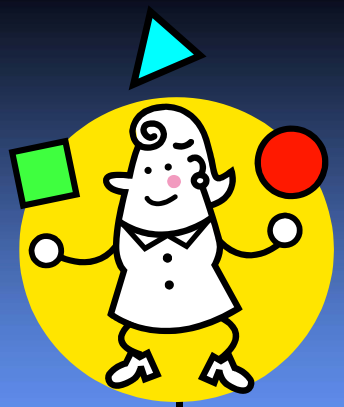
1996;3(4):250

Outline

- Introduction
- Vision & Logic Model Discussion
- JAD Session Overview & Project Management Issues
- Models-to-date (UML & Non-UML Diagrams)
- Next Steps

NPCR-MERP Introduction

Our Assumptions



- Cancer surveillance is getting increasingly complex and advanced, so some new ways need to be explored to address and manage this complexity.
- Common trends and approaches from other fields are relevant and applicable for cancer registration.
- The shift to some form EHR's will continue within the healthcare industry

Source: David Lyalin & Warren Williams

Types of Models

Physical, Pictorial (graphs), Symbolic (abstract)

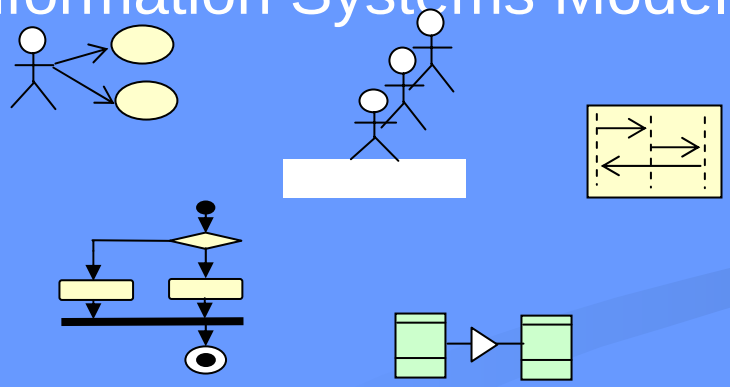
Fashion Modeling

Mathematical/Statistical Modeling

$$\ln(p_k) = \varepsilon_k + \beta_1 O_1 + \beta_2 O_2 + \ldots + \beta_p O_p$$

Hobby Modeling

Business Process &
Information Systems Modeling



Source: David Lyalin & Warren Williams

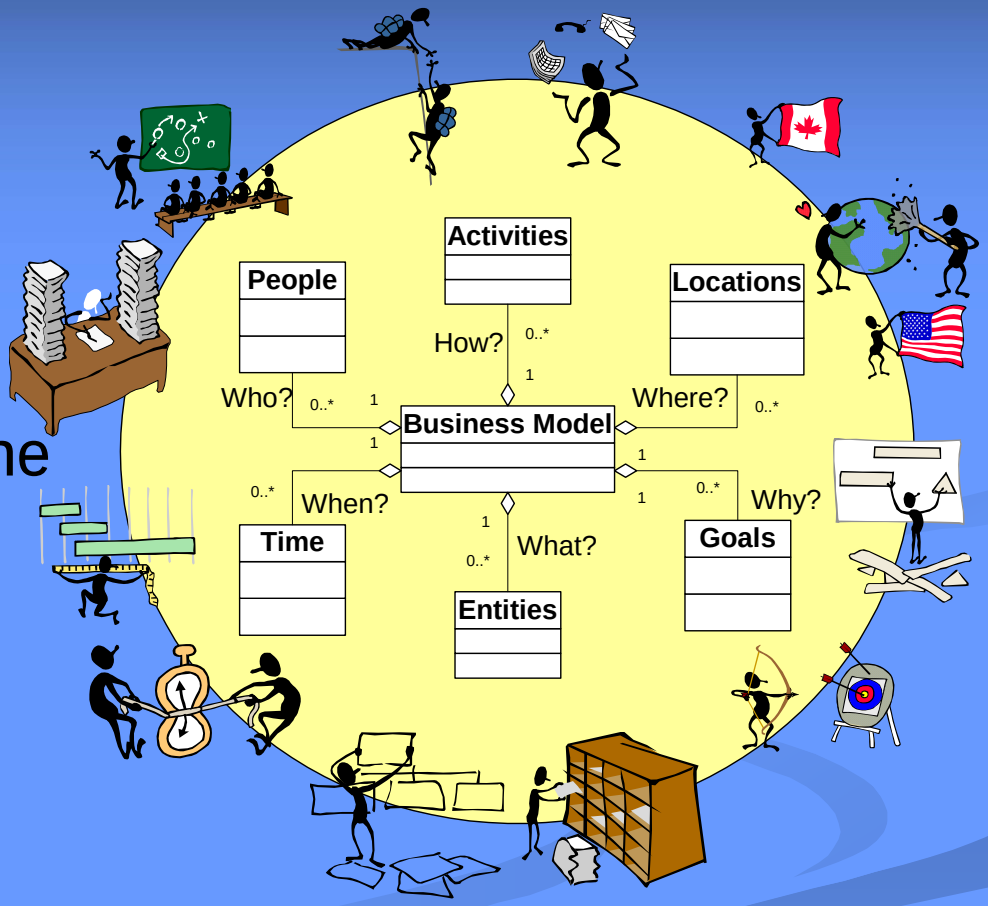
As-Is Model and To-Be Model

- As-Is Model: to document existing business
- To-Be Model: to document “ideal” business

Source: David Lyalin & Warren Williams

What Needs To Be Captured in the Model?

- Goals – purposes and outcomes
- Structures – organizational units, people, locations, materials, information, ...
- Processes – how work is done within the business
- Rules - policies and constraints
- Events



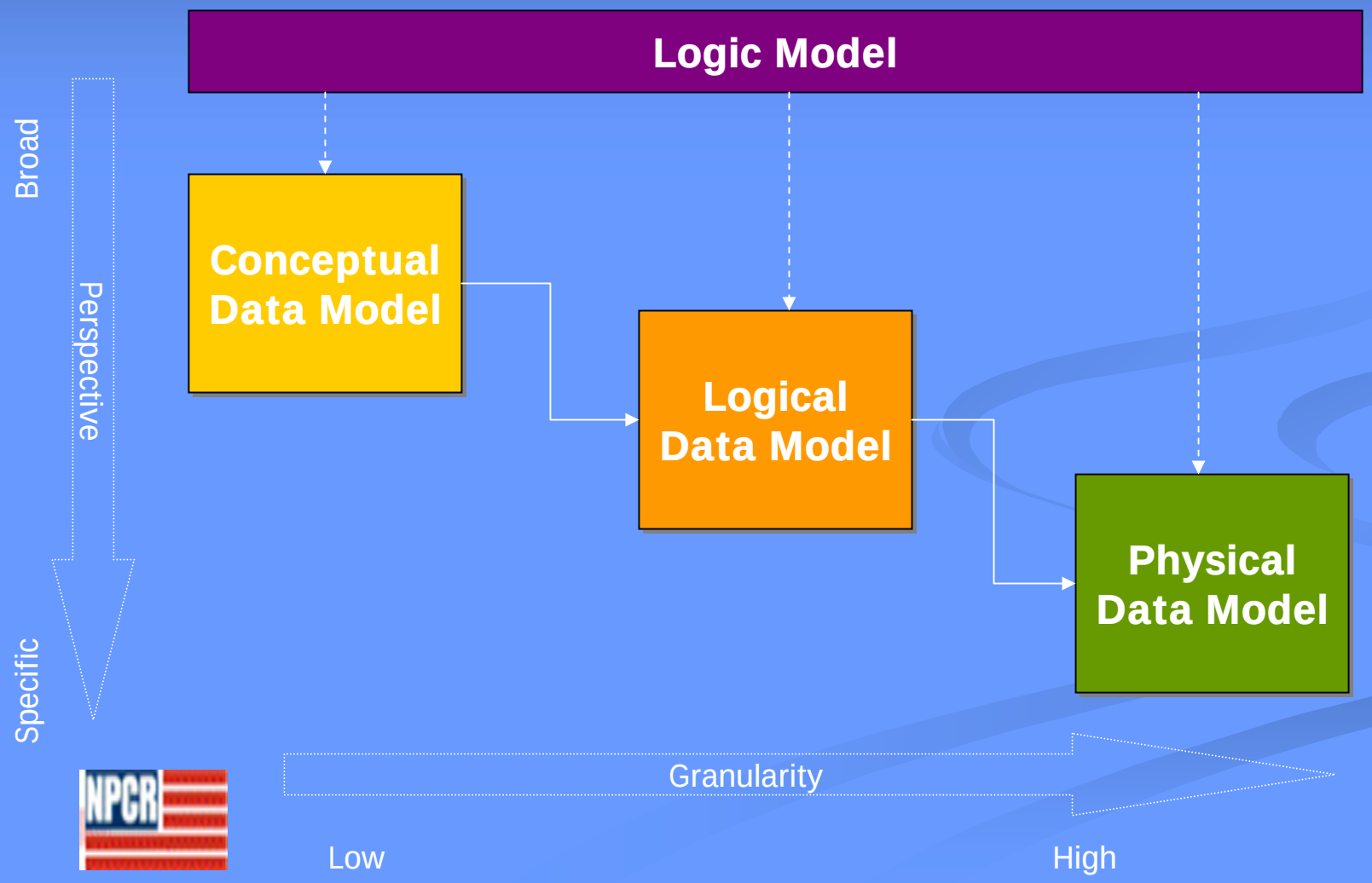
Source: David Lyalin & Warren Williams

CDC Public Health Conceptual Data Model (7/2000)

- Conceptual Data Model – (30,000 ft view point)
  - High level/big picture model
- Logical Data Model – (Roof top view)
  - Outlines forms, definitions, and standards of the data elements
  - A blueprint of the data within the entire organization or data landscape
- Physical Data Model – (Ground level view)
  - Business specific rules are captured (transaction types, volume, security issues, etc.)
  - Usually based upon the Logical Data Model but adds performance requirements and special characteristics needed for software implementation
- *Logic Model*
  - General non-technical visual representation of any project/program

Source: http://www.cdc.gov/nedss/DataModels/index.html

How they fit together



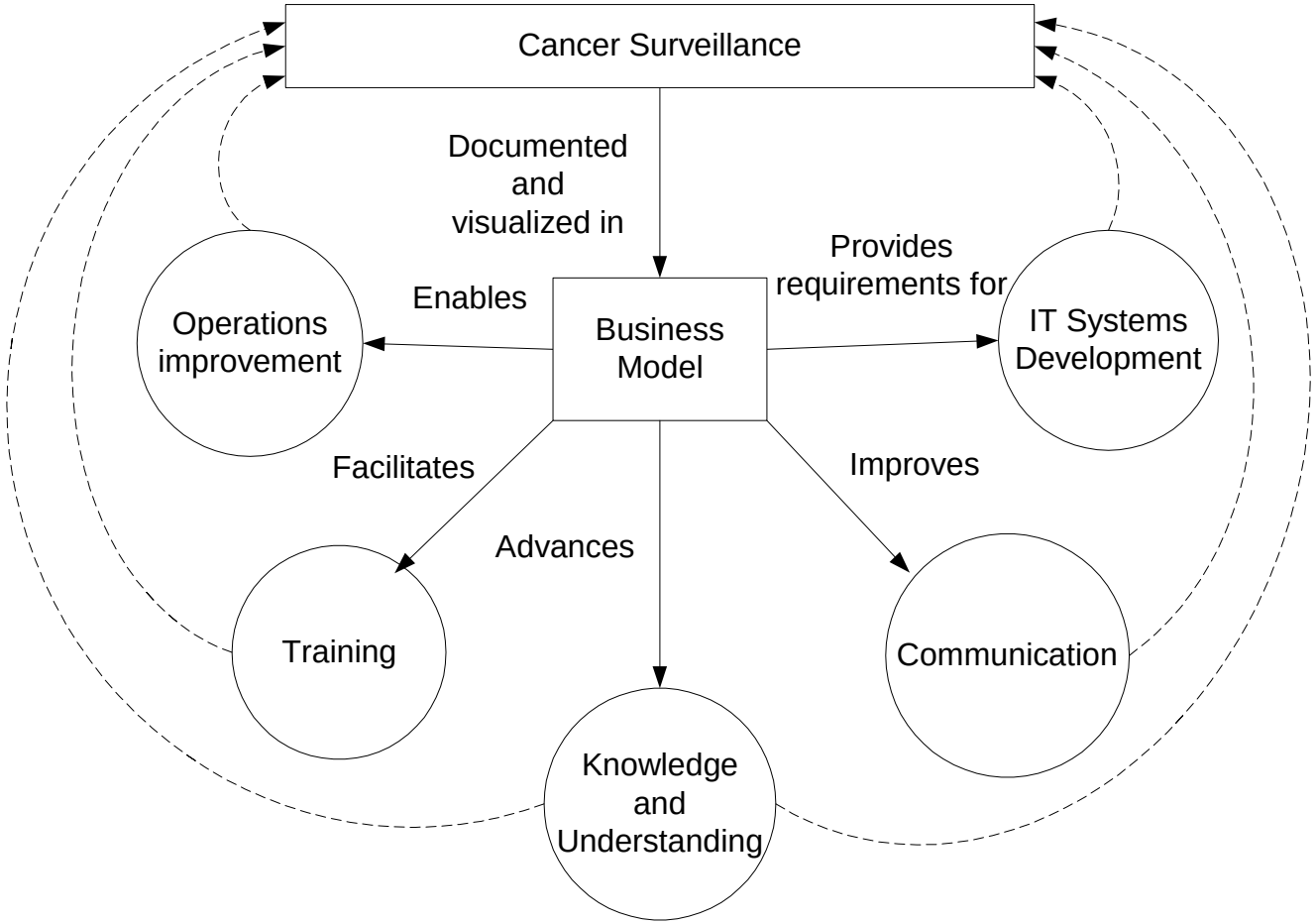
What Models Can Do

- Reduce complexity of cancer surveillance (simplification) to manageable level.
- Purge secondary details and focuses on one or more relevant aspects at a time.
- Each diagram can provide a limited specialized view of the business, making it easier to focus on one aspect at a time.
- Capture facts and provide answers –

  Who? Where? How? When? What? Why?

Source: David Lyalin & Warren Williams

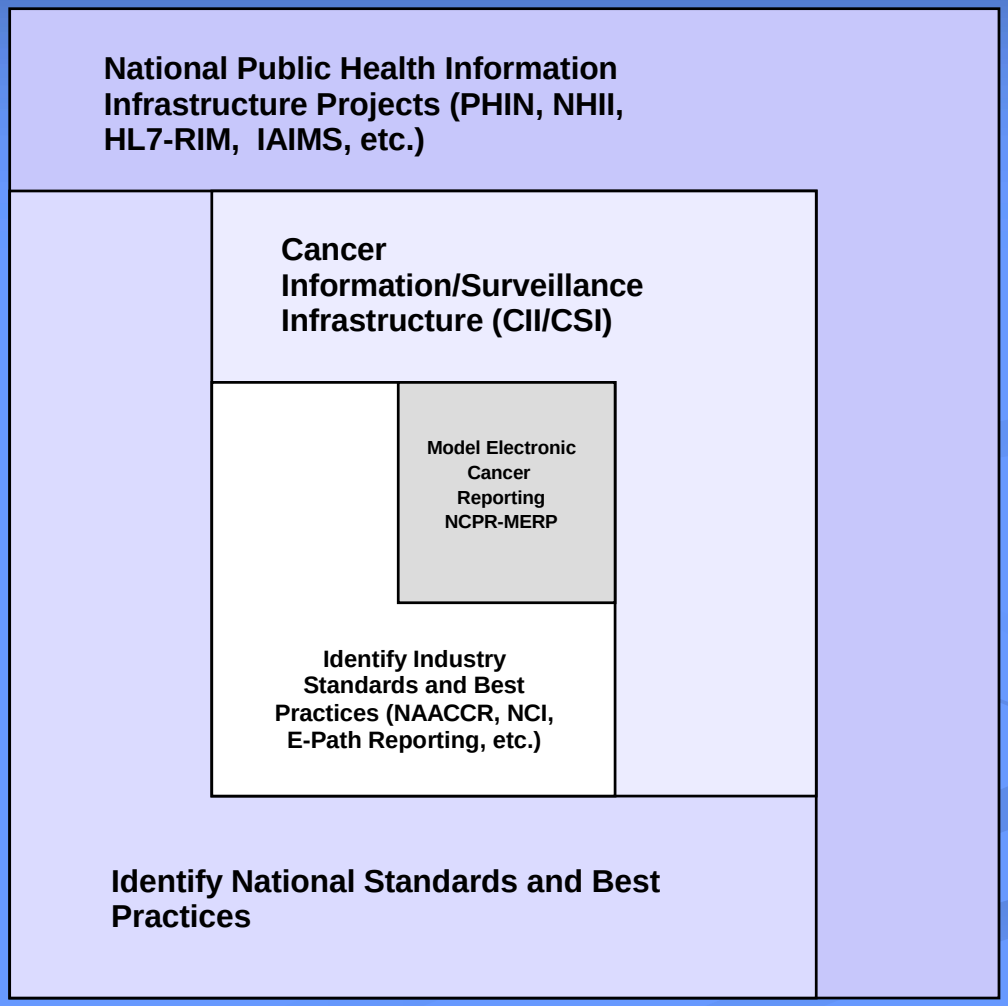
Modeling Concepts applied to Cancer Surveillance



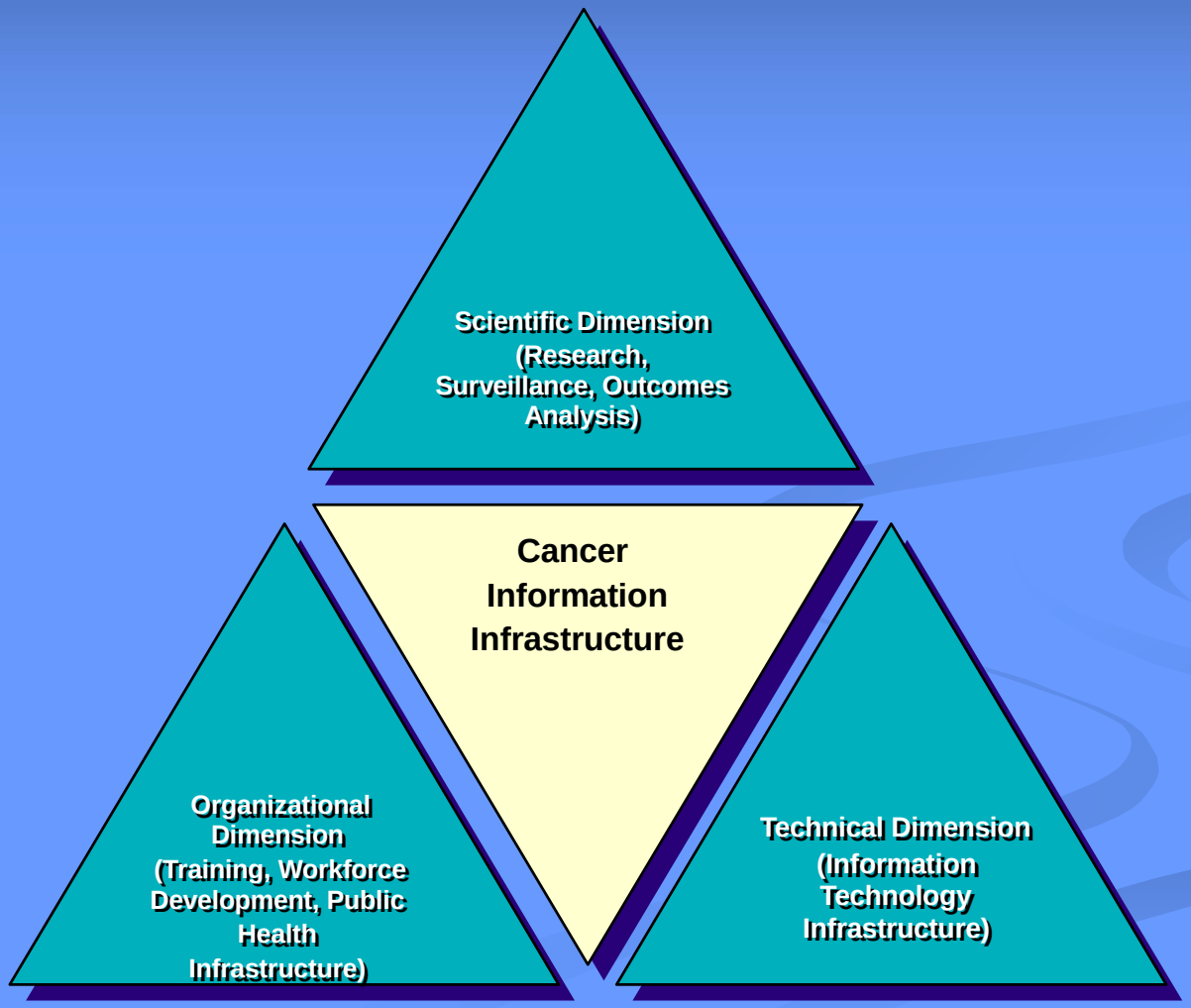
Source: David Lyalin & Warren Williams

NPCR-MERP Vision Summary & Logic Model

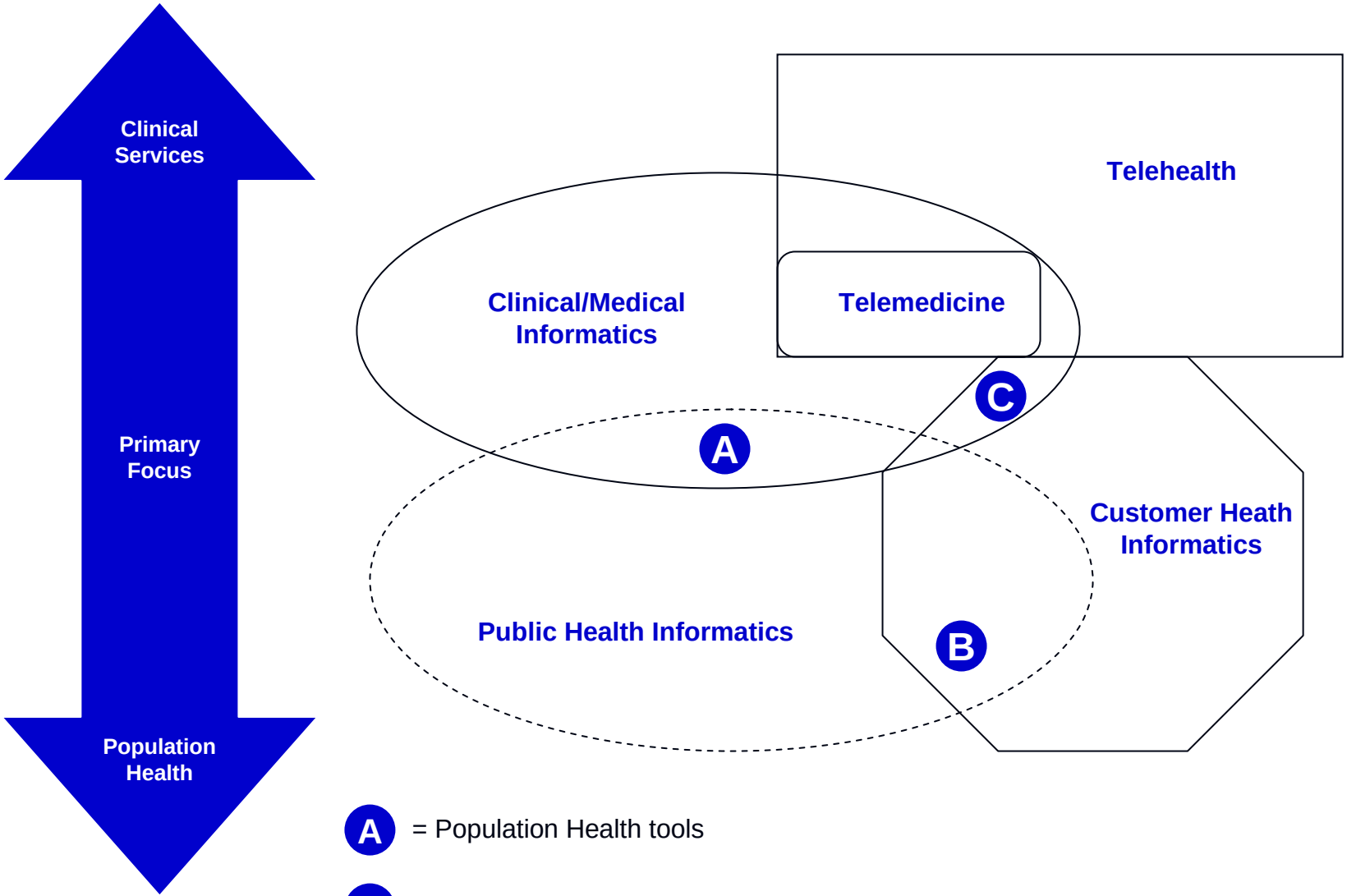
The Big Fish Theory



Cancer Information/Surveillance Infrastructure Components



Relationship Between Various Components of eHealth



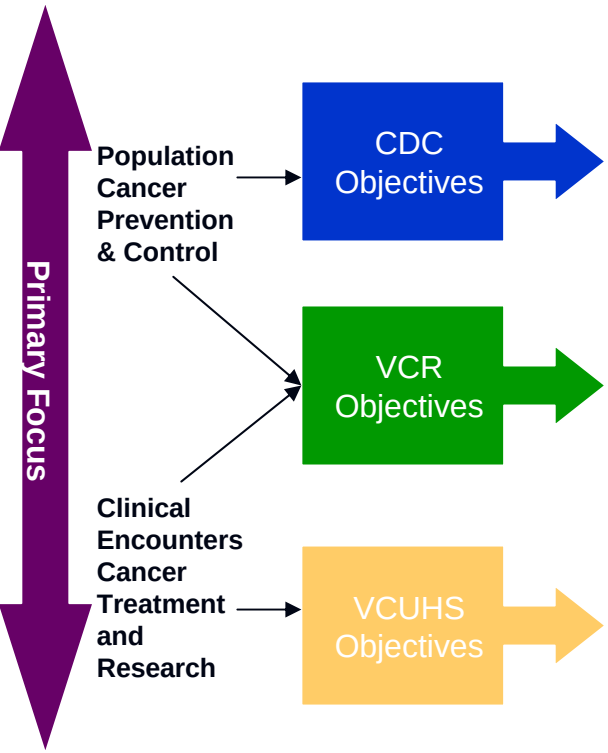
A = Population Health tools

B = Health promotion/disease tools

C = Shared clinical decision-making tools

Source: The eHealth Landscape 2001 Thomas Eng/RWJ

Draft NPCR-MERP Logic Model v.1



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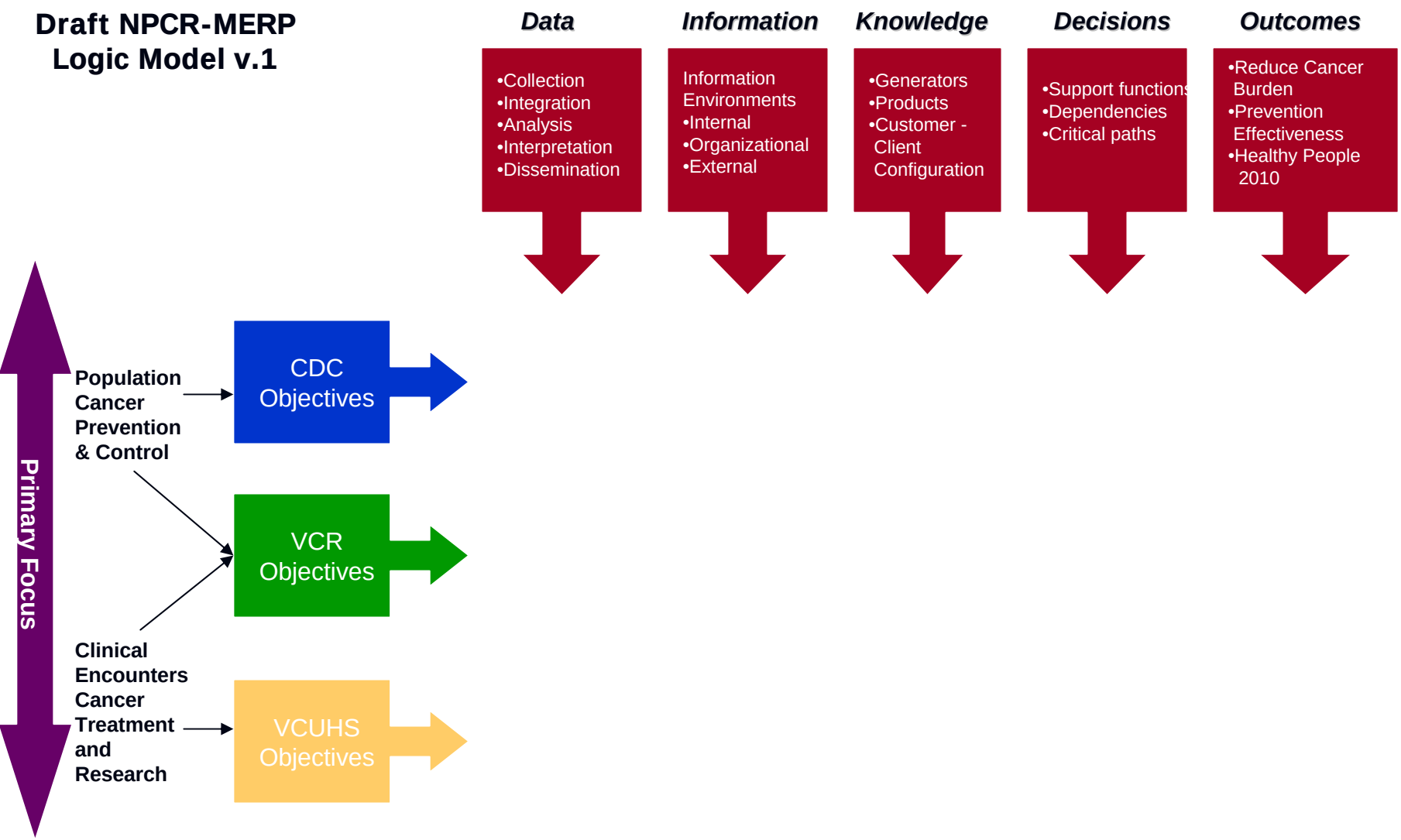

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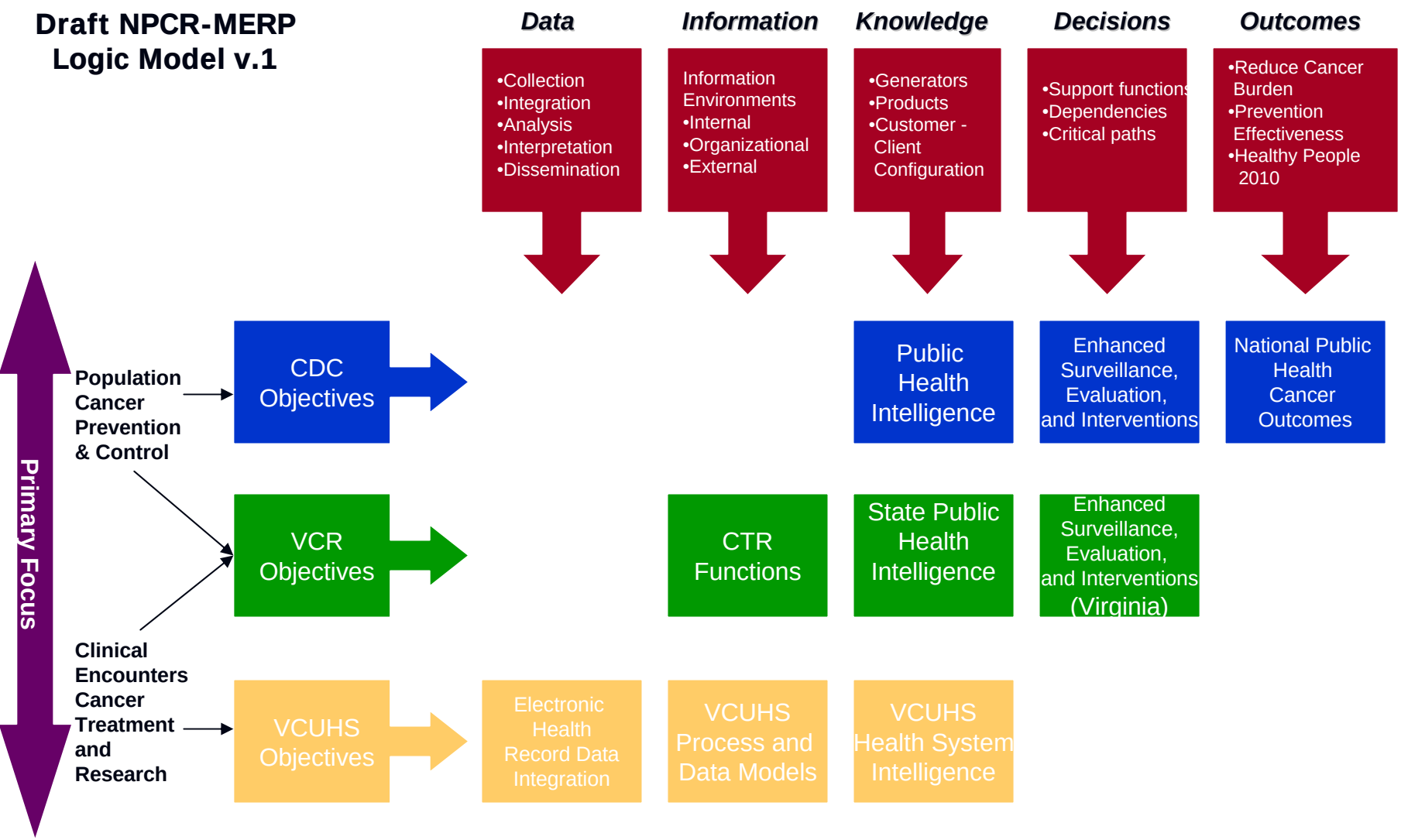

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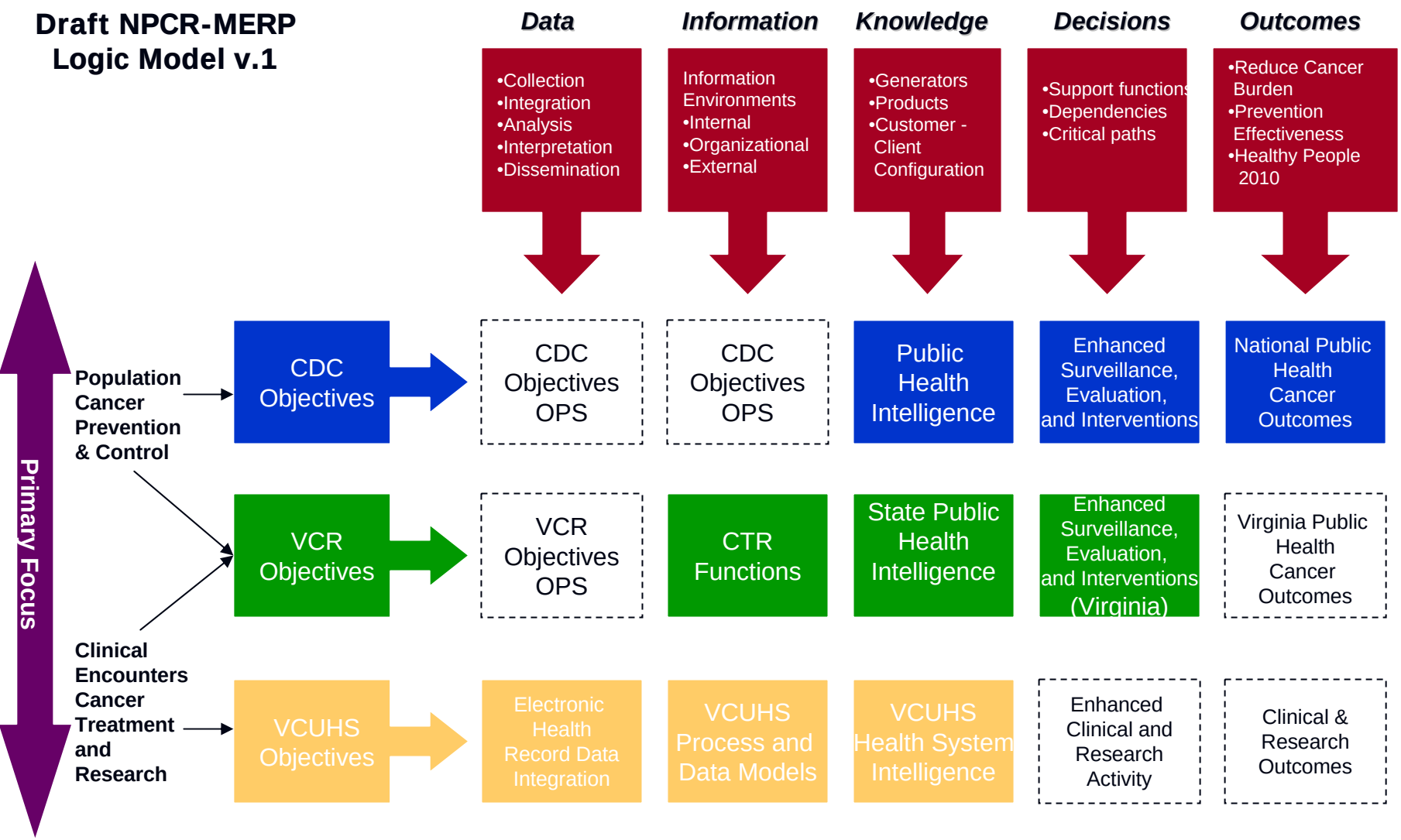

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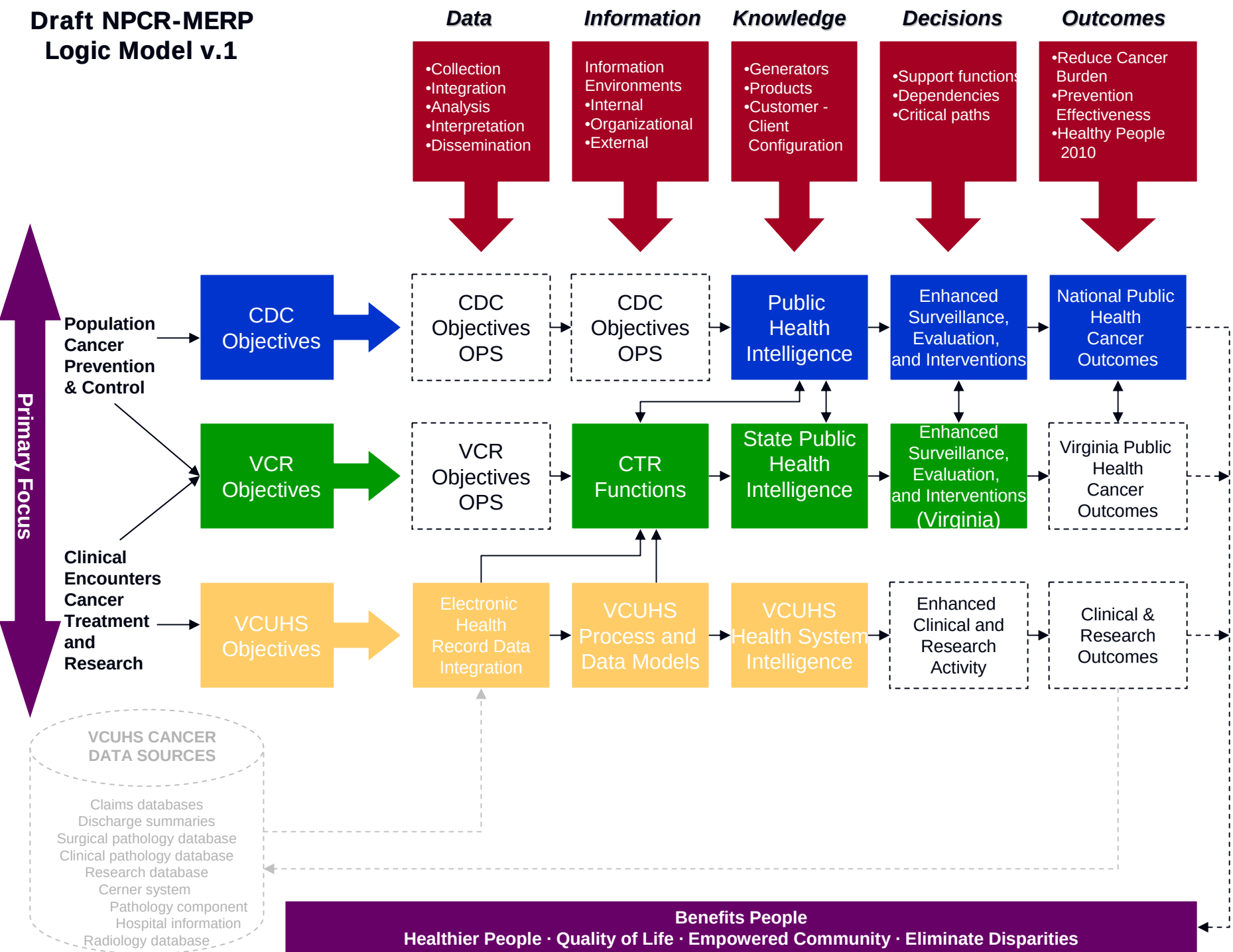

Impact Measures

- VCUHS
  - Clinical (Patient outcomes)
  - Research (Knowledge generation)
  - Organizational (efficiency – cost, time, quality) – Maturity Analysis
- VCR
  - Public Health (statewide surveillance, evaluation, and intervention)
  - Organizational (efficiency – cost, time, quality) – Maturity Analysis
- CDC
  - Public Health (national surveillance, evaluation, and intervention)
  - Organizational (NPCR objectives)
  - Policy (Programmatic effectiveness, ROI, public health outcomes)

NPCR-MERP Project

JAD Session & Project Management Issues

NPCR-MERP Phase I

Phase I

- Develop
- Test implementation of the model in a large hospital setting (VCUHS)
- Distribute the model via the NPCR-MERP Website for input
- *Form a CDC-NCI Collaborative Workgroup*

NPCR-MERP 2-Day JAD Session

- Introduction
  - UML Diagram Overview (purpose, scope)
  - UML Notation Review
  - Factors that contribute to the diagram
- Established base-line evaluative criteria
  - As-Is Review
  - To-Be Development
- Identified issues, concerns, and next steps

JAD Session Outputs

- Detailed feedback on UML Diagrams
- Desire for both UML & Non-Diagrams
- Key terms (Metadata dictionary)
- Criteria for evaluating the model

NPCR-MERP UML Diagrams

- NPCR-MERP UML Model
  - Use Case Diagram - A technique to capture business process from user's perspective
  - Activity diagrams - Shows the flow of activities through the system and their relation to one another
  - Class Diagram - Shows the existence of domains (classes) and their relationships in the logical view of a system
  - Sequence Diagram - Displays object interactions arranged in a time sequence
  - State Transition Diagram - Shows the life history of a given class, the events that cause a transition from one state to another, and the actions that result from a state change

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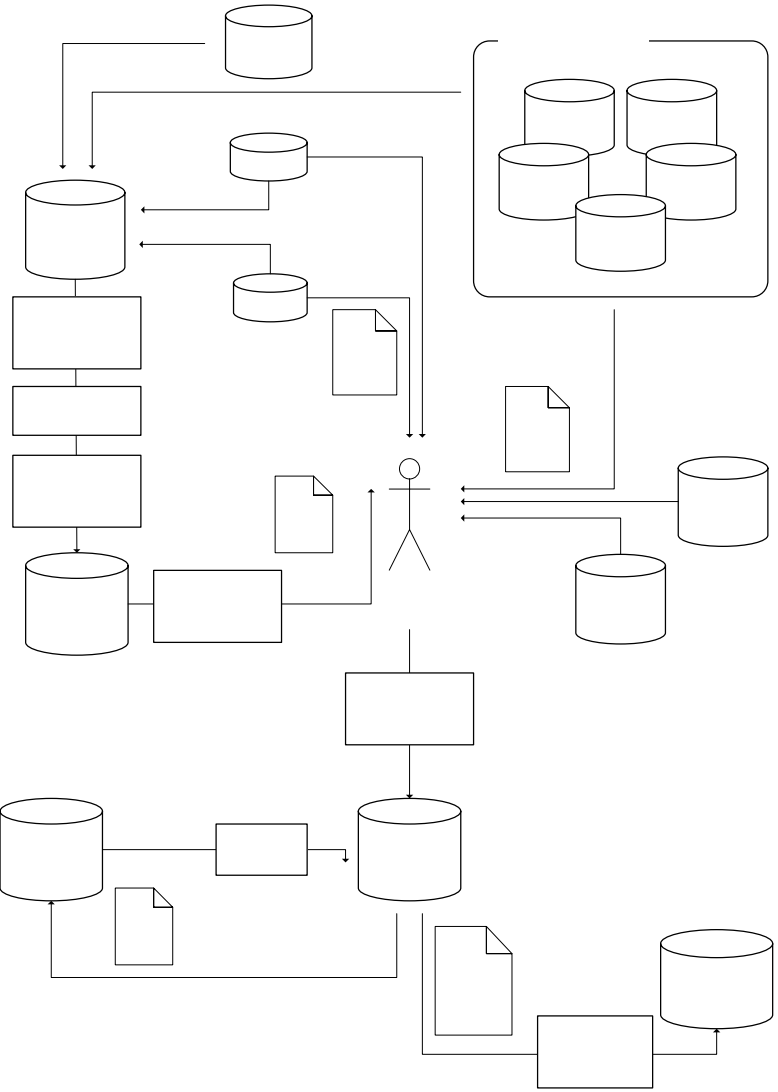
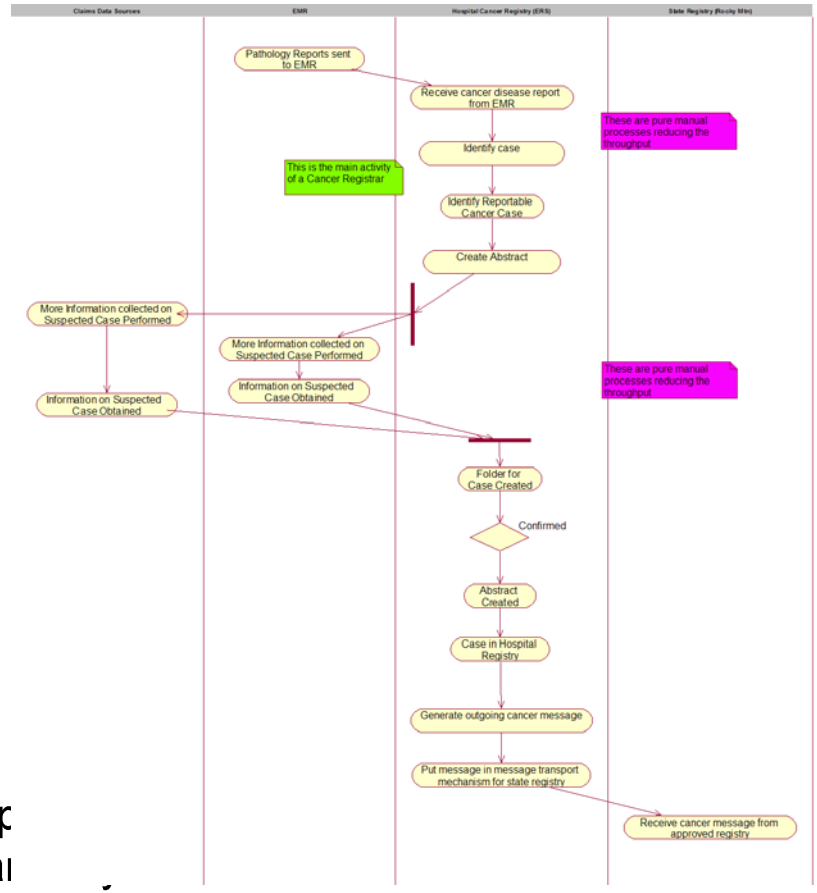
NPCR-MERP Models

UML & Non-UML Diagrams

Visual Displays





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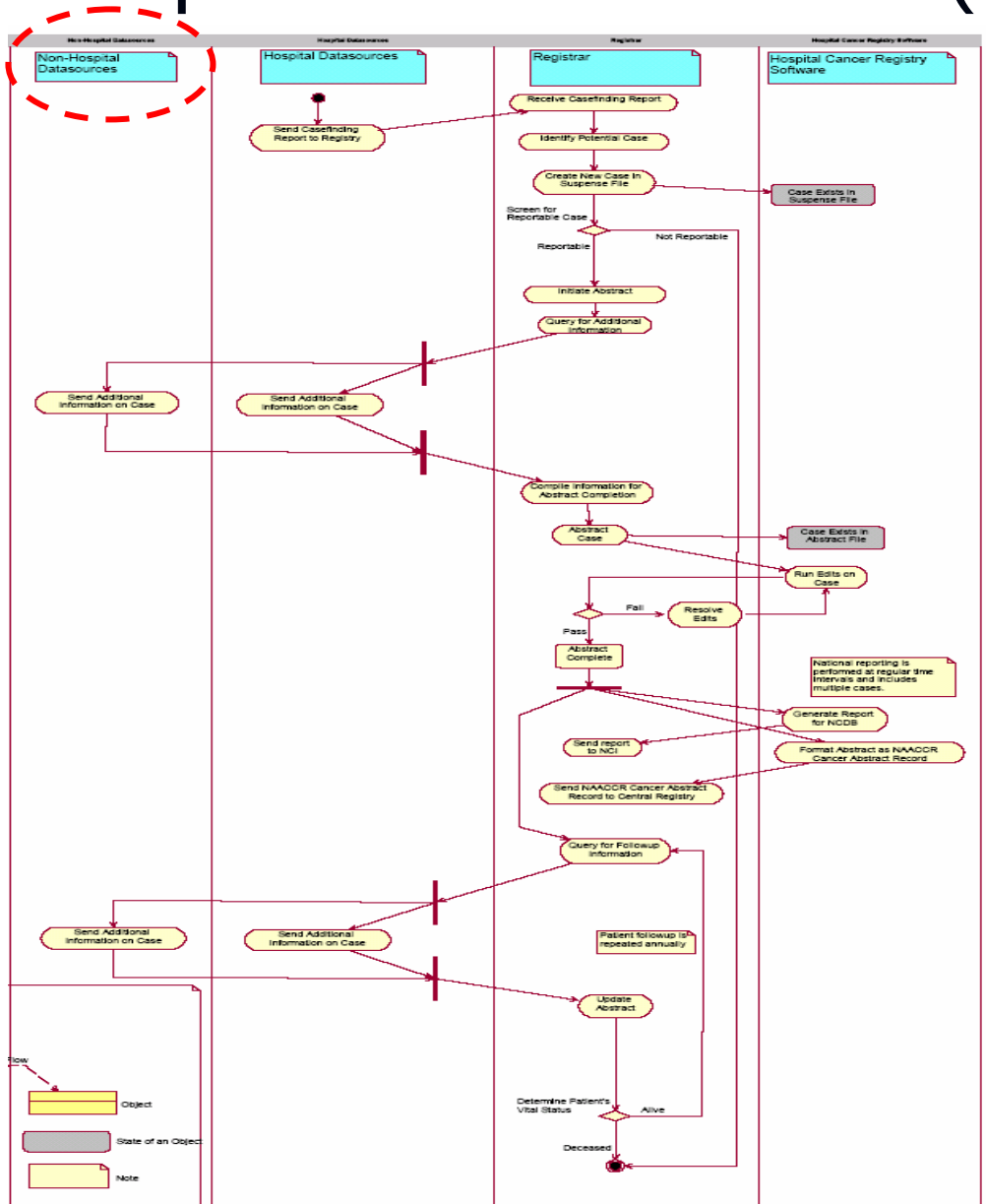
Current Hospital Data Processes (UML)



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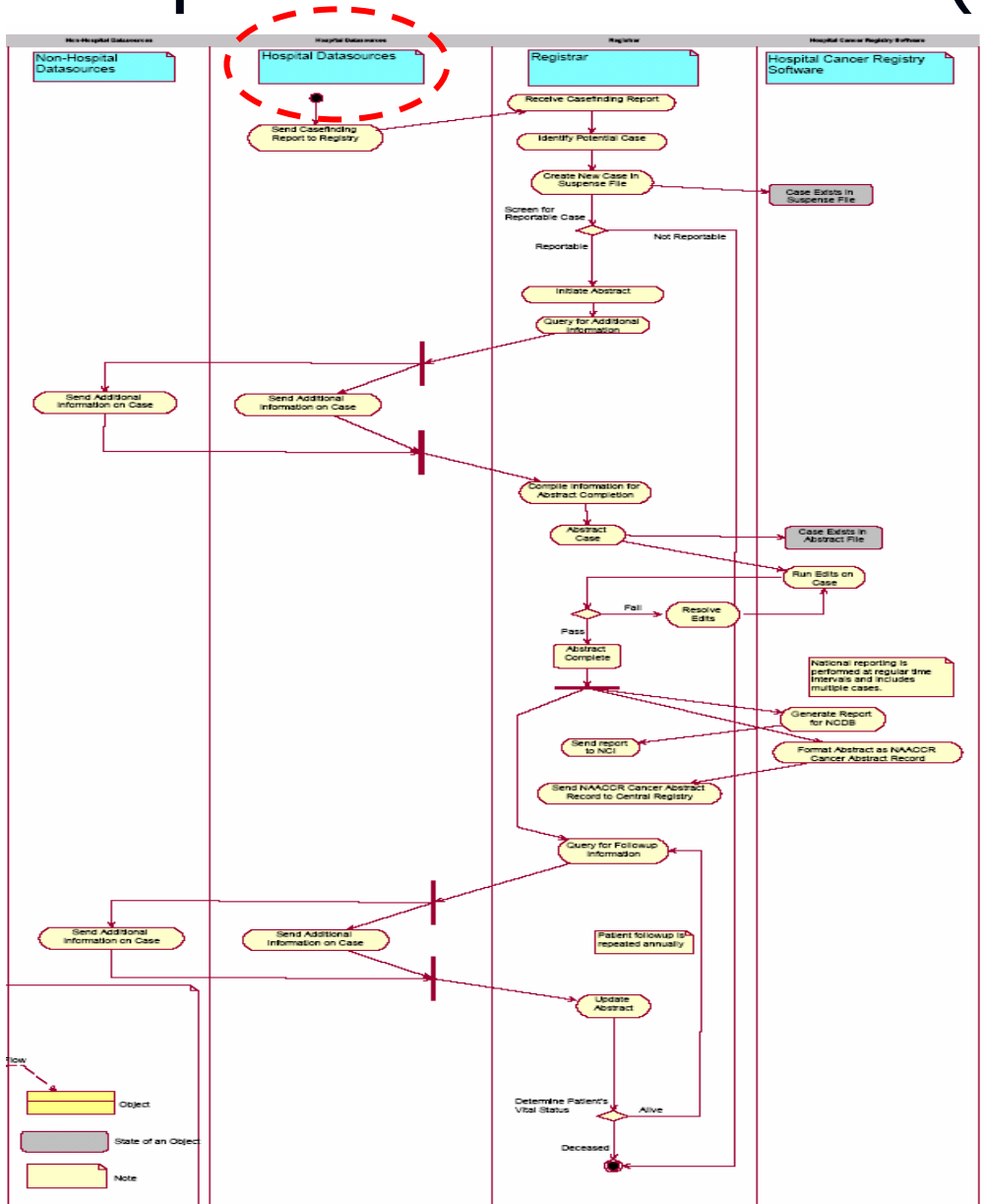

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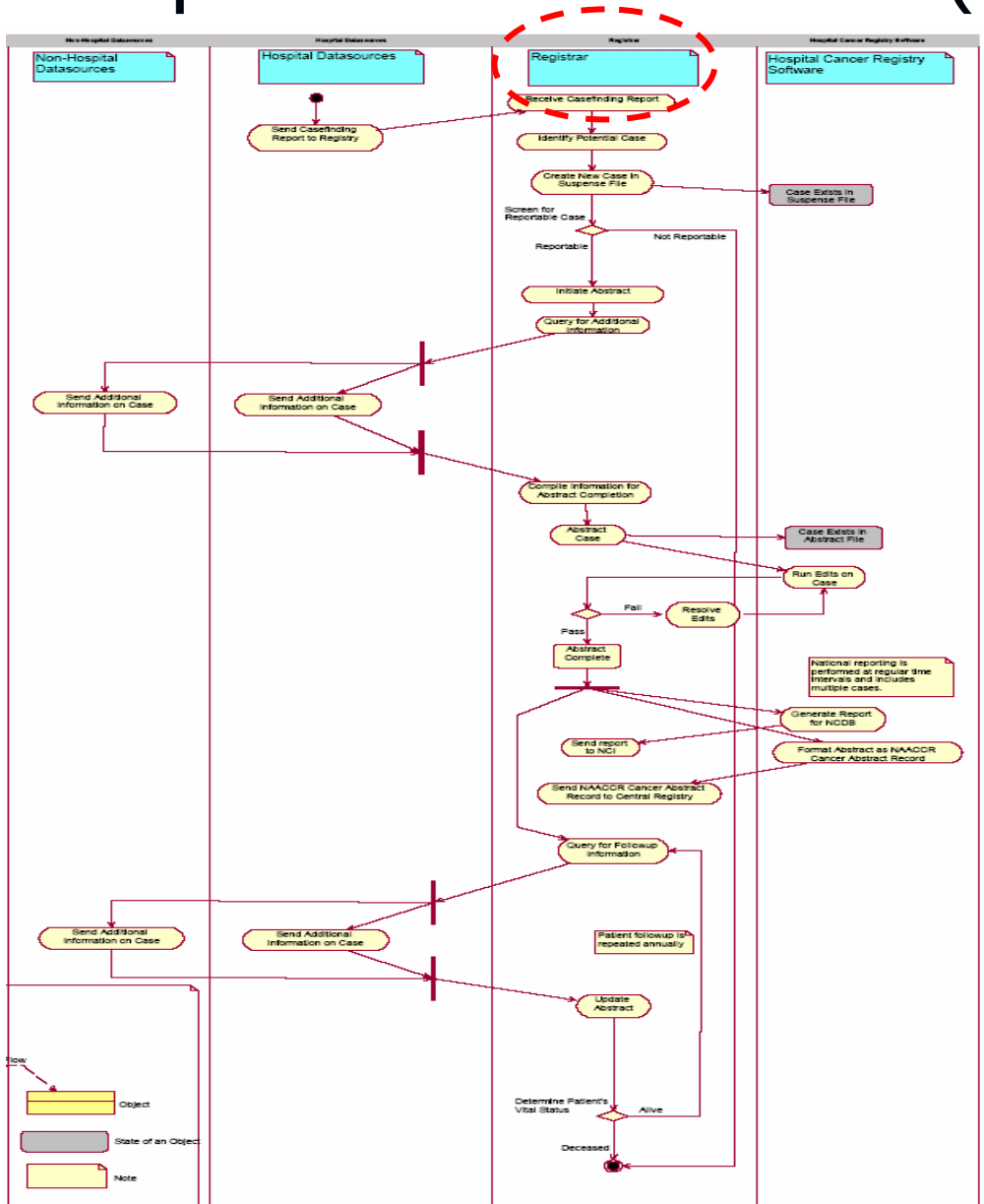

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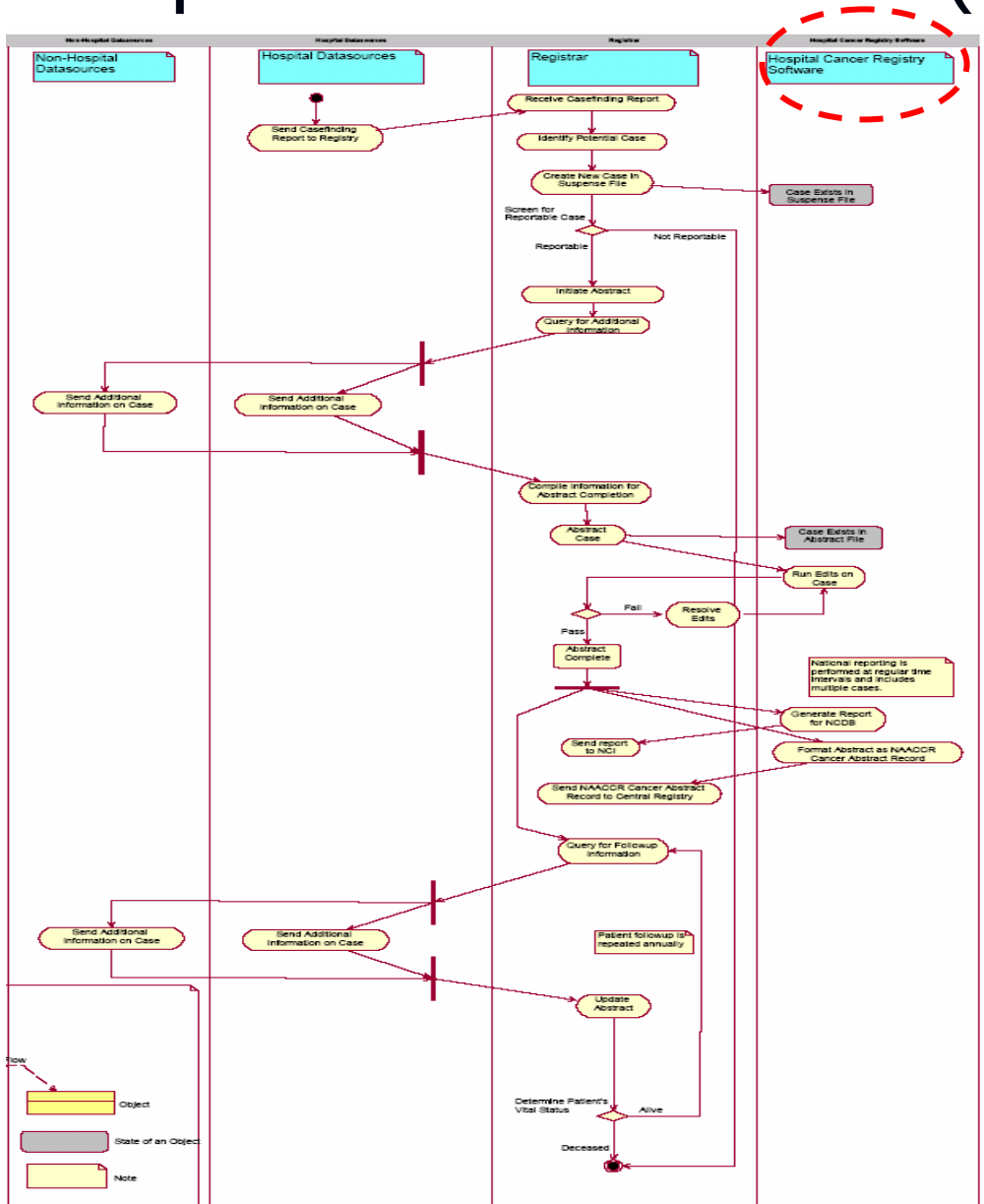
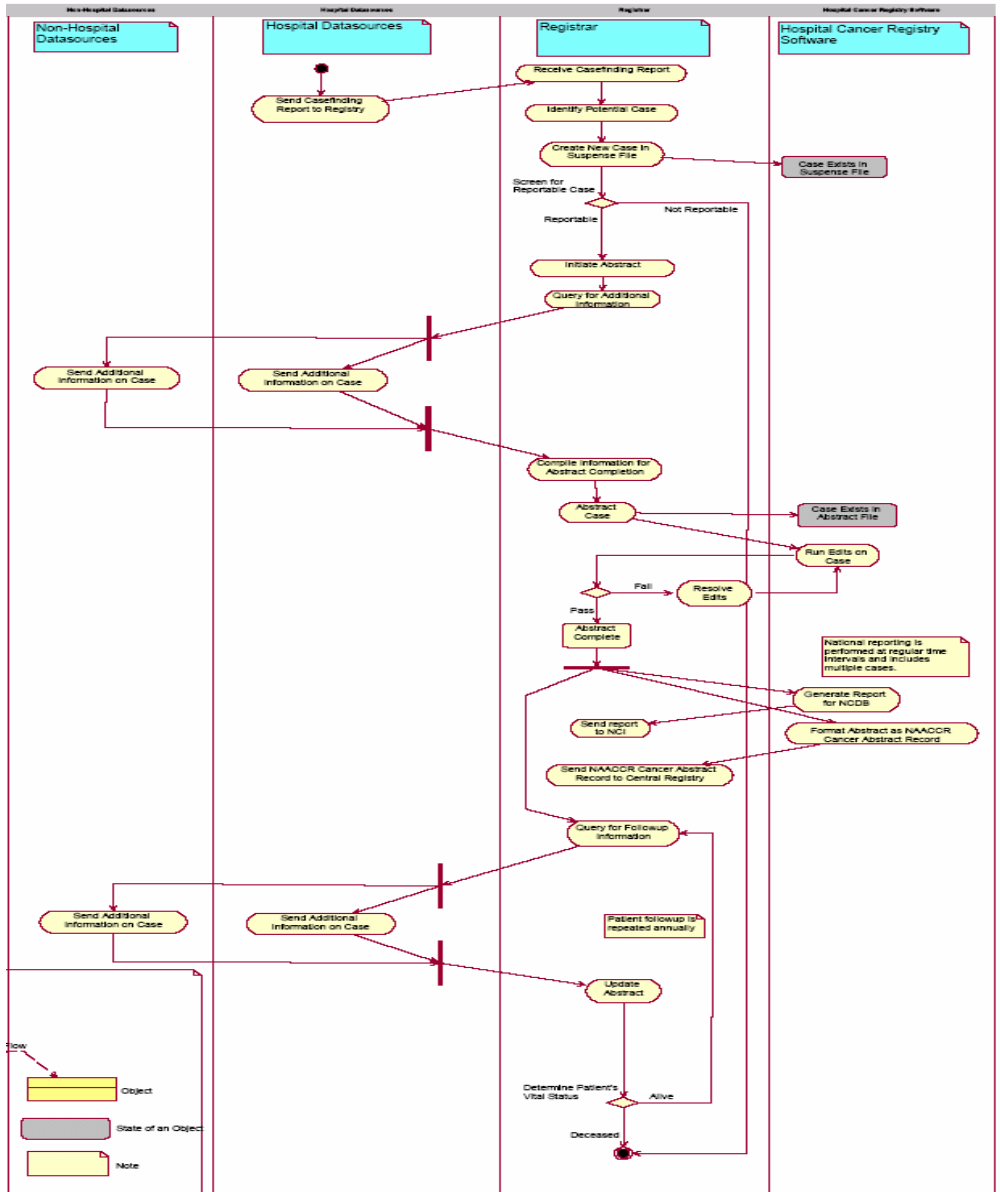


Current Hospital Data Processes (UML)

Key Activities

- Treatment
- Case Finding
- Editing
- Follow-up



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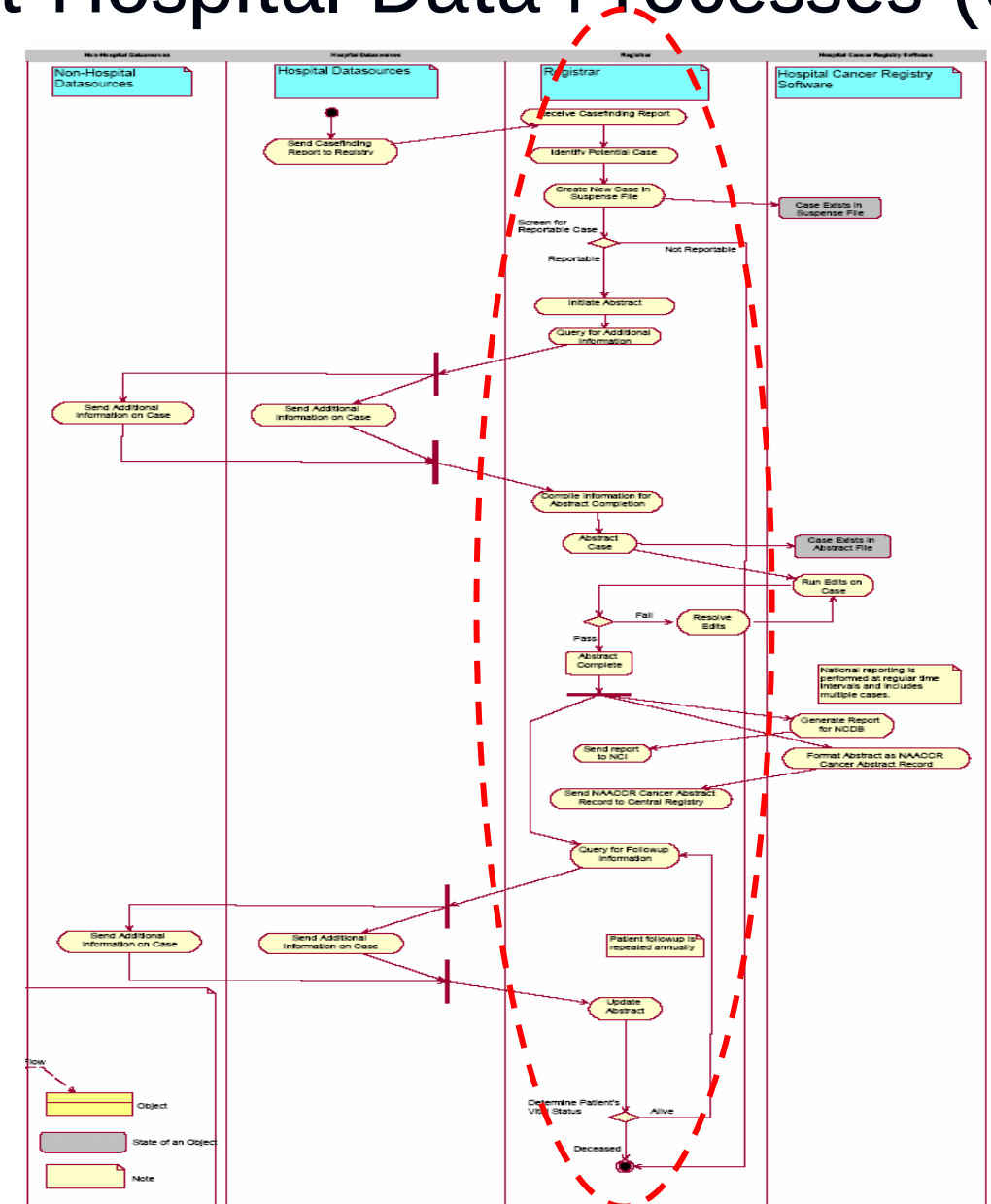

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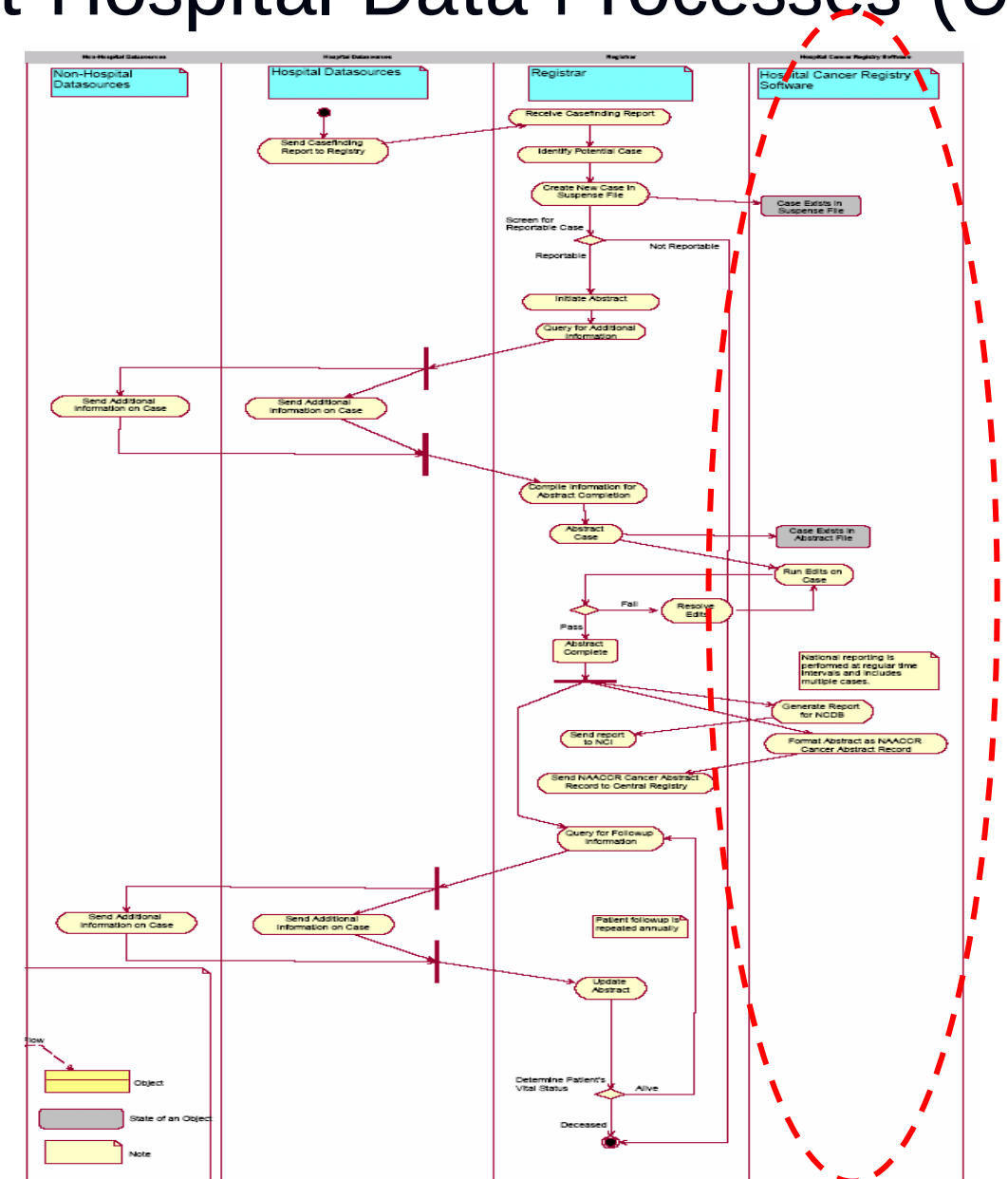
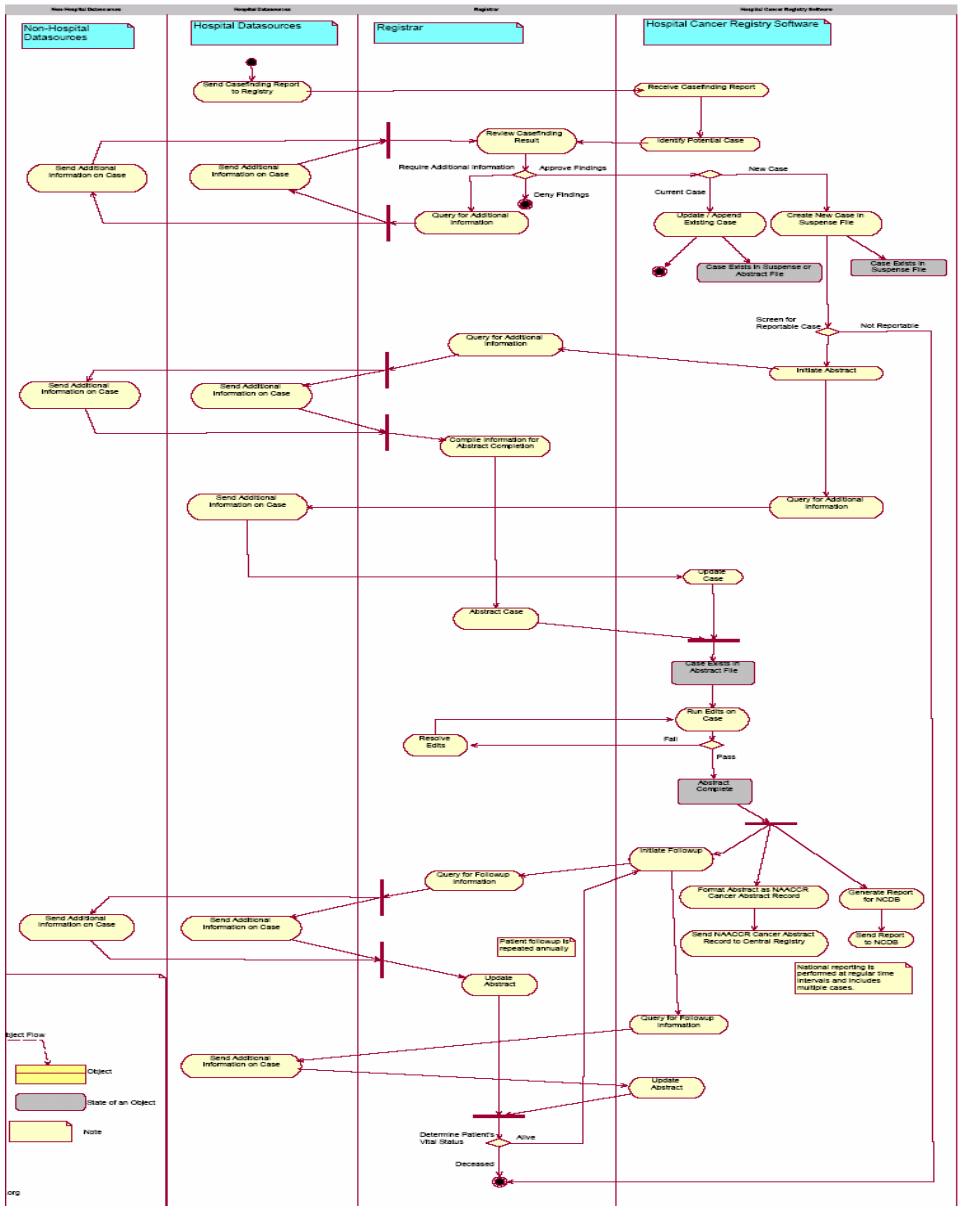


Proposed Hospital Data Processes (UML)



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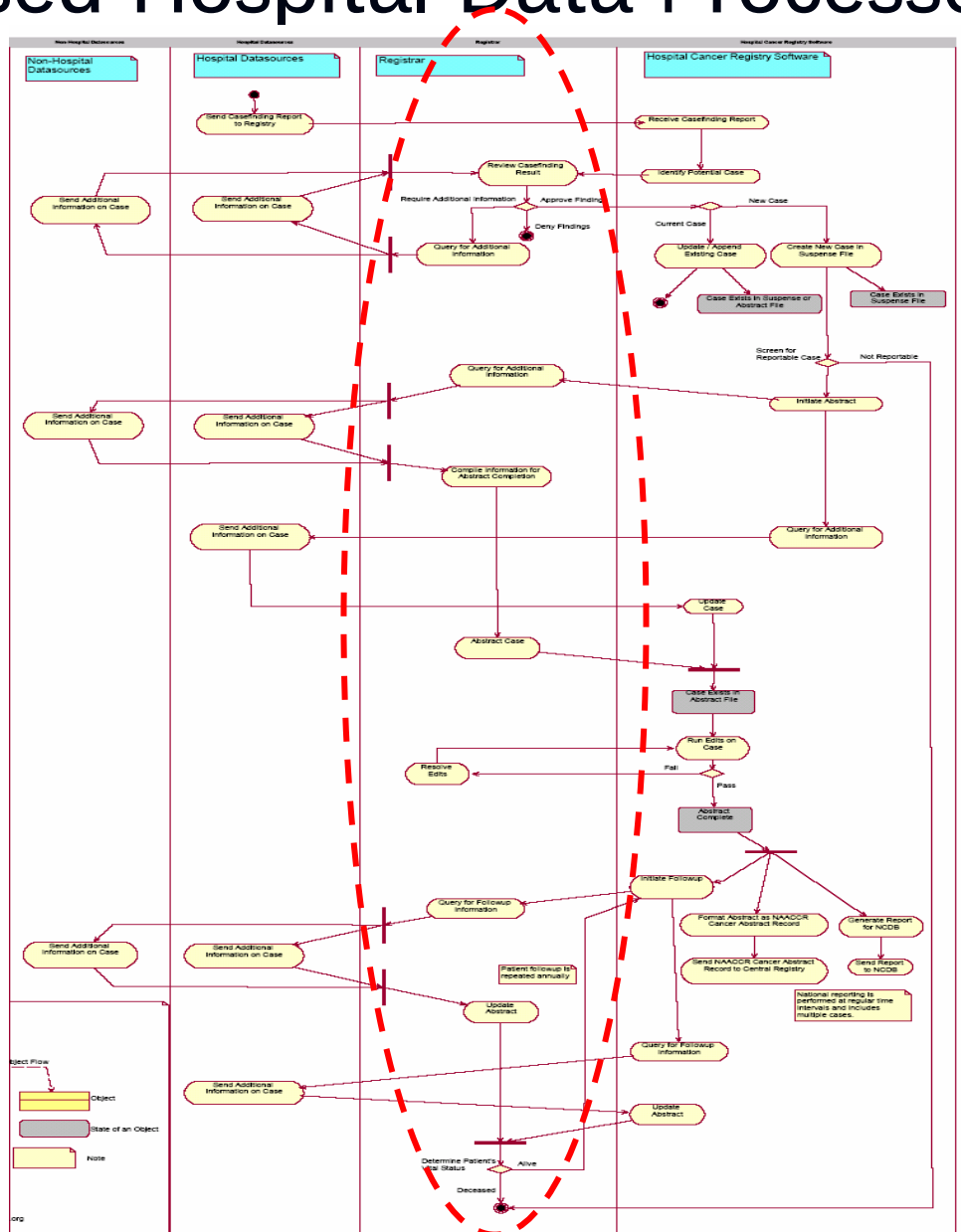

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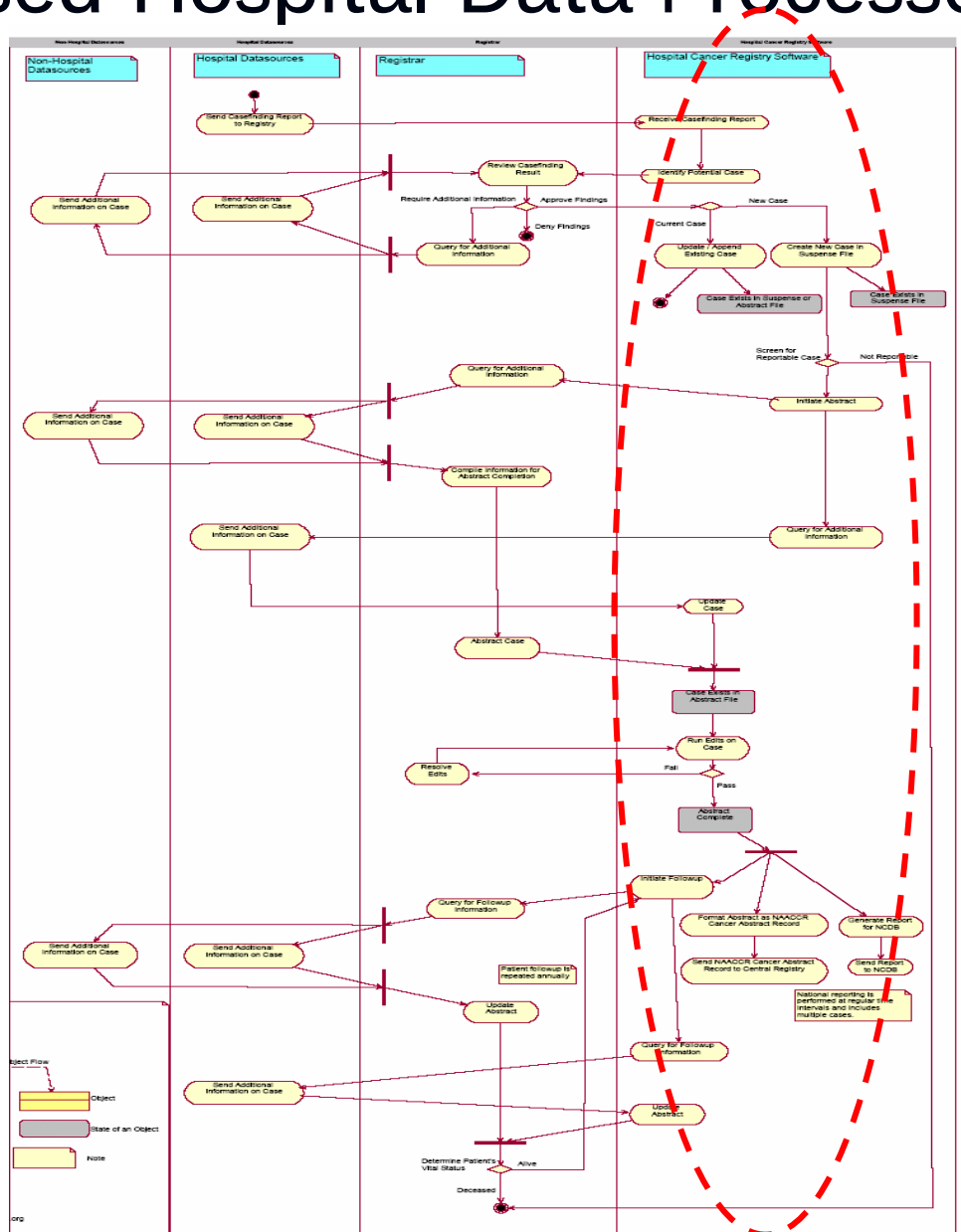

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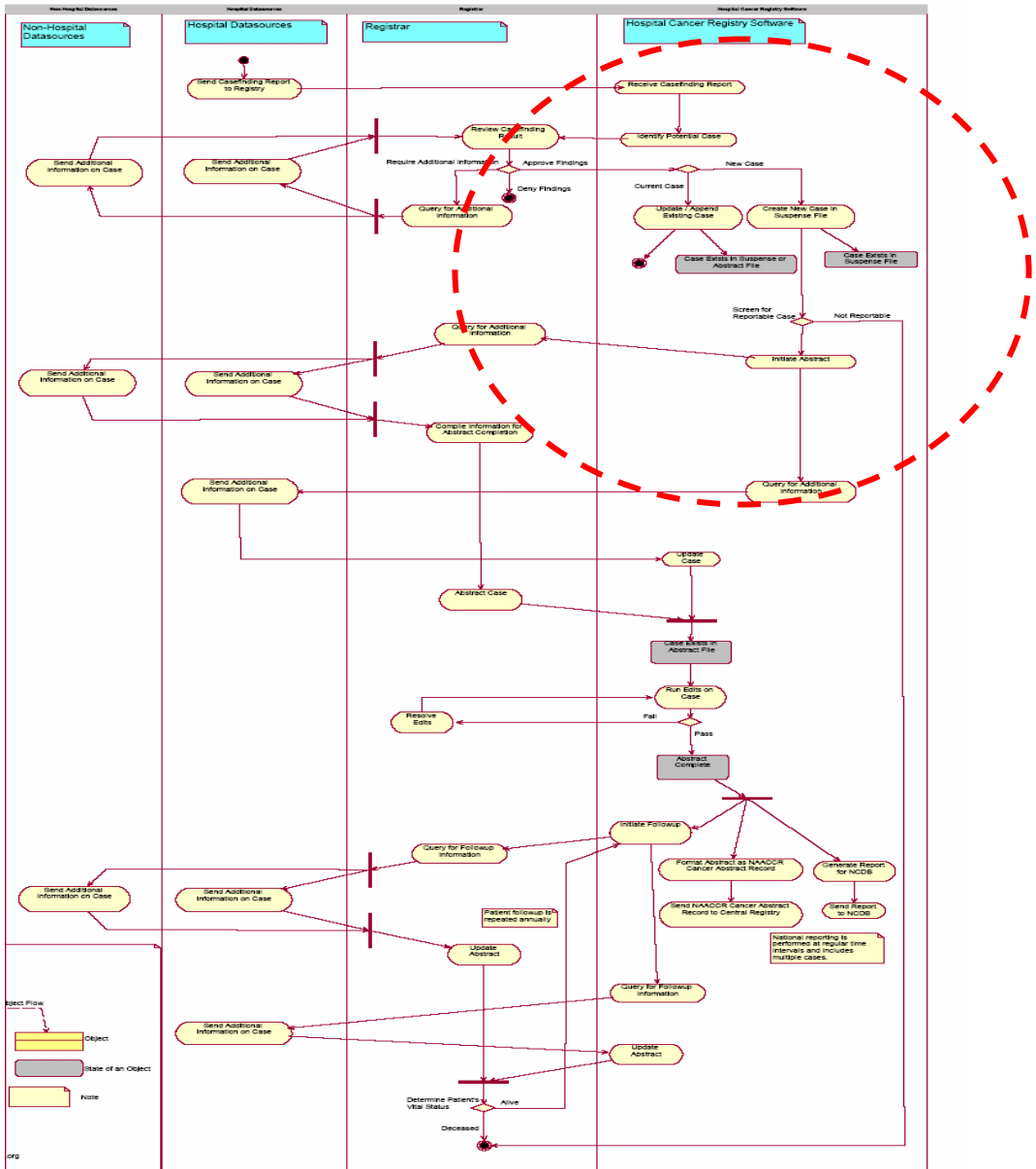
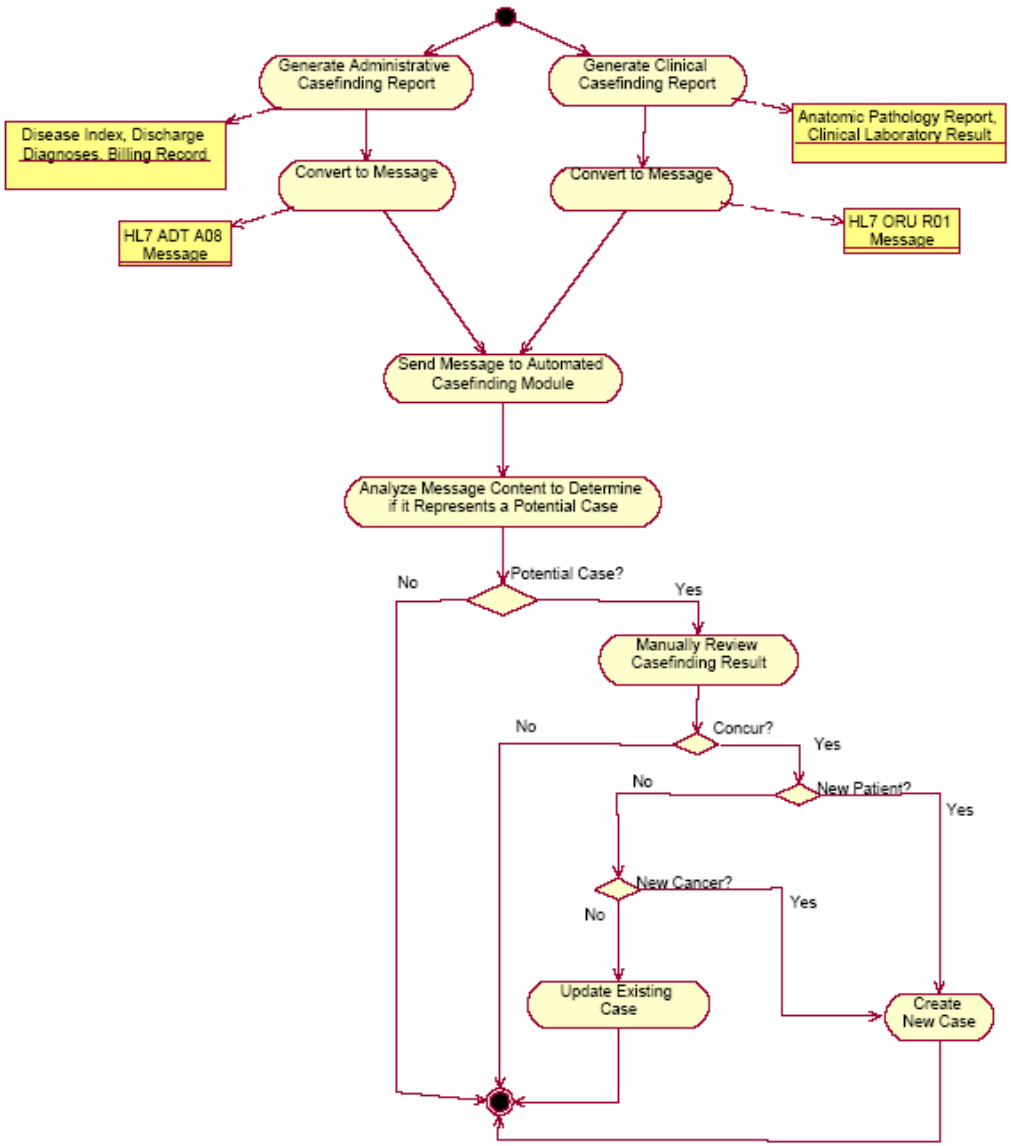
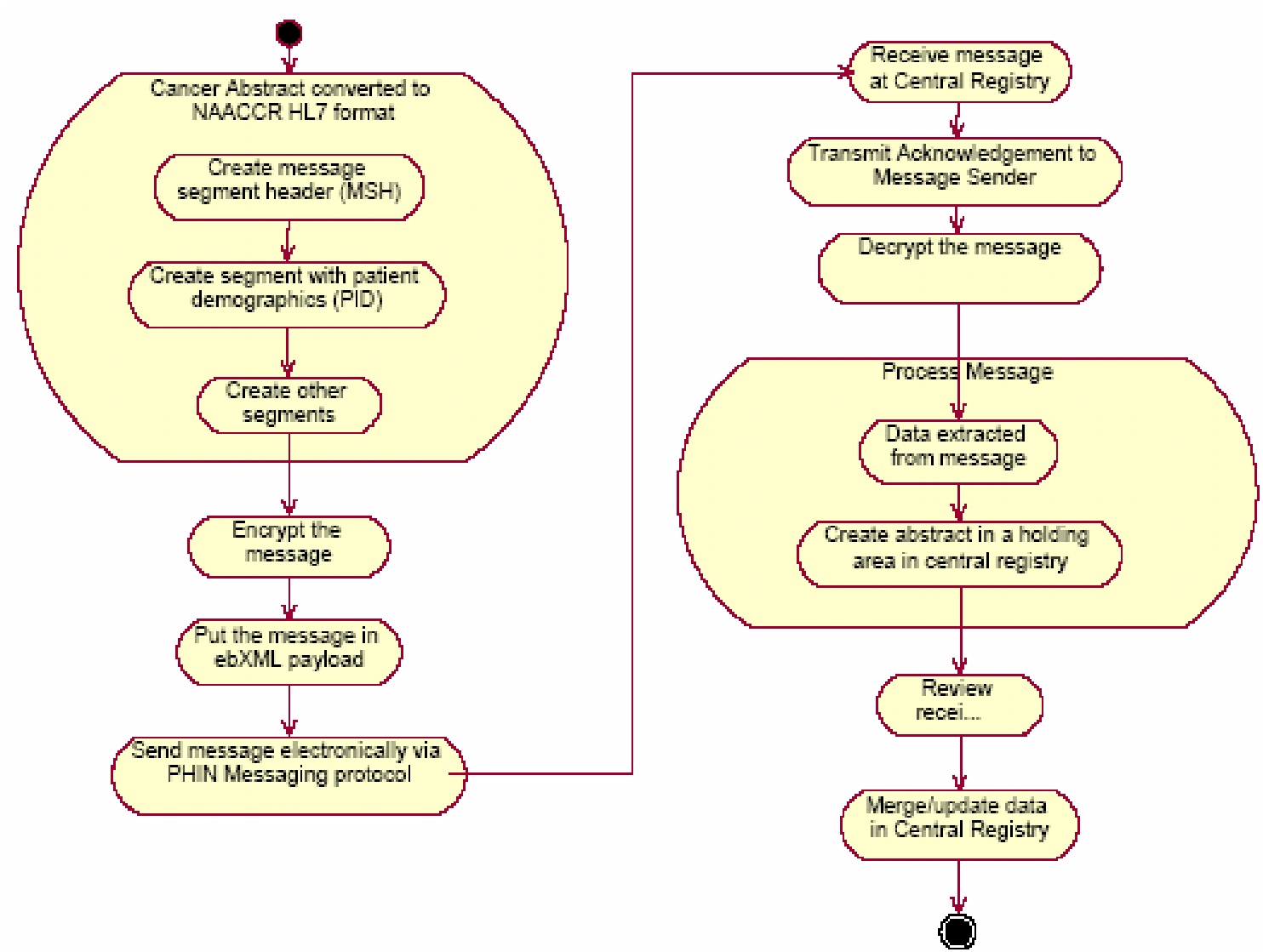


Automated Case Finding (UML)



Propose Electronic Reporting to Cancer Registry Protocol



NPCR-MERP PHASE II

- NPCR-MERP & NCI-SEER Collaboration Team
- Steering Committee

NPCR-MERP Objectives

Phase II

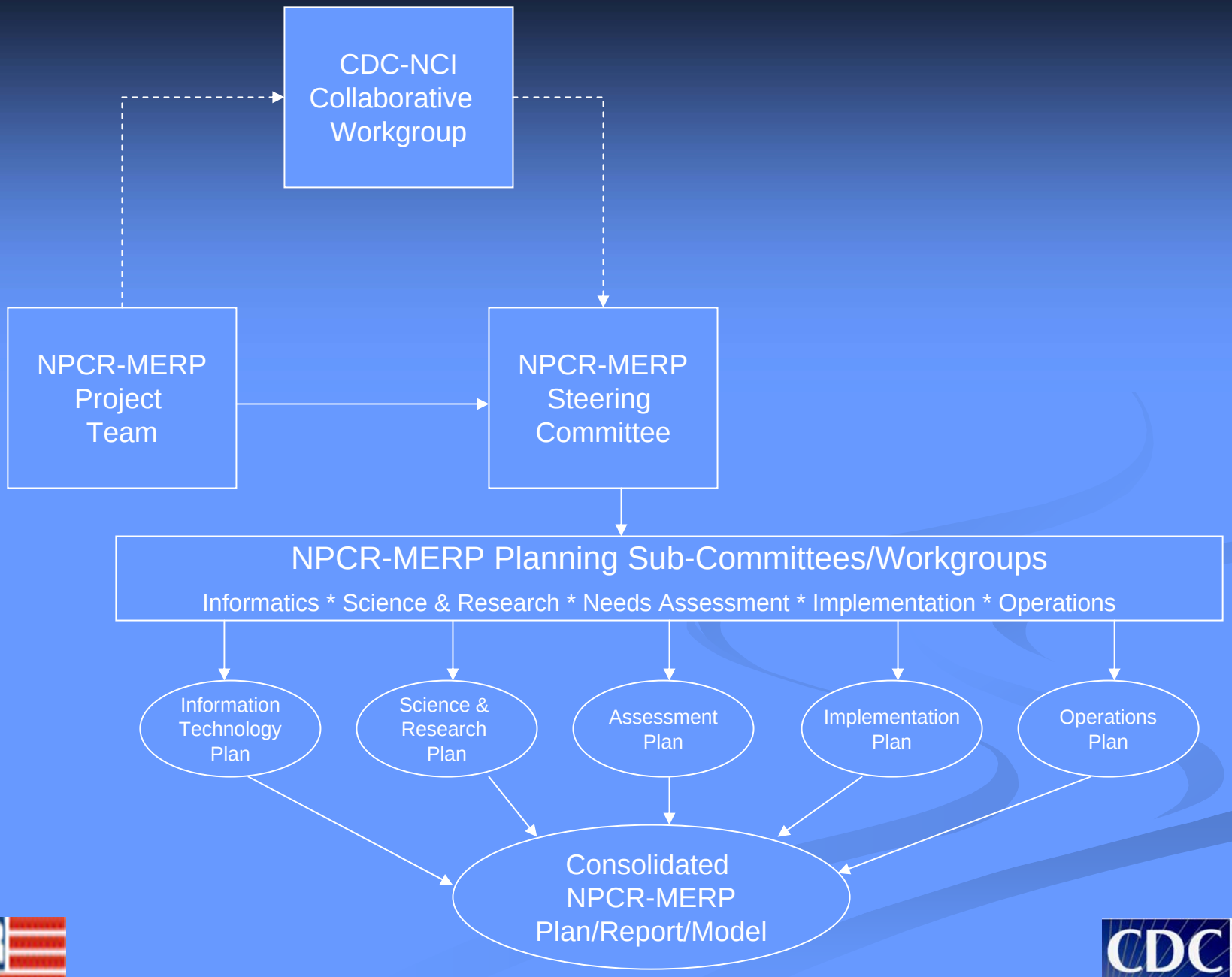
- National plan
- Reflect national best practices
- Assess the transportability

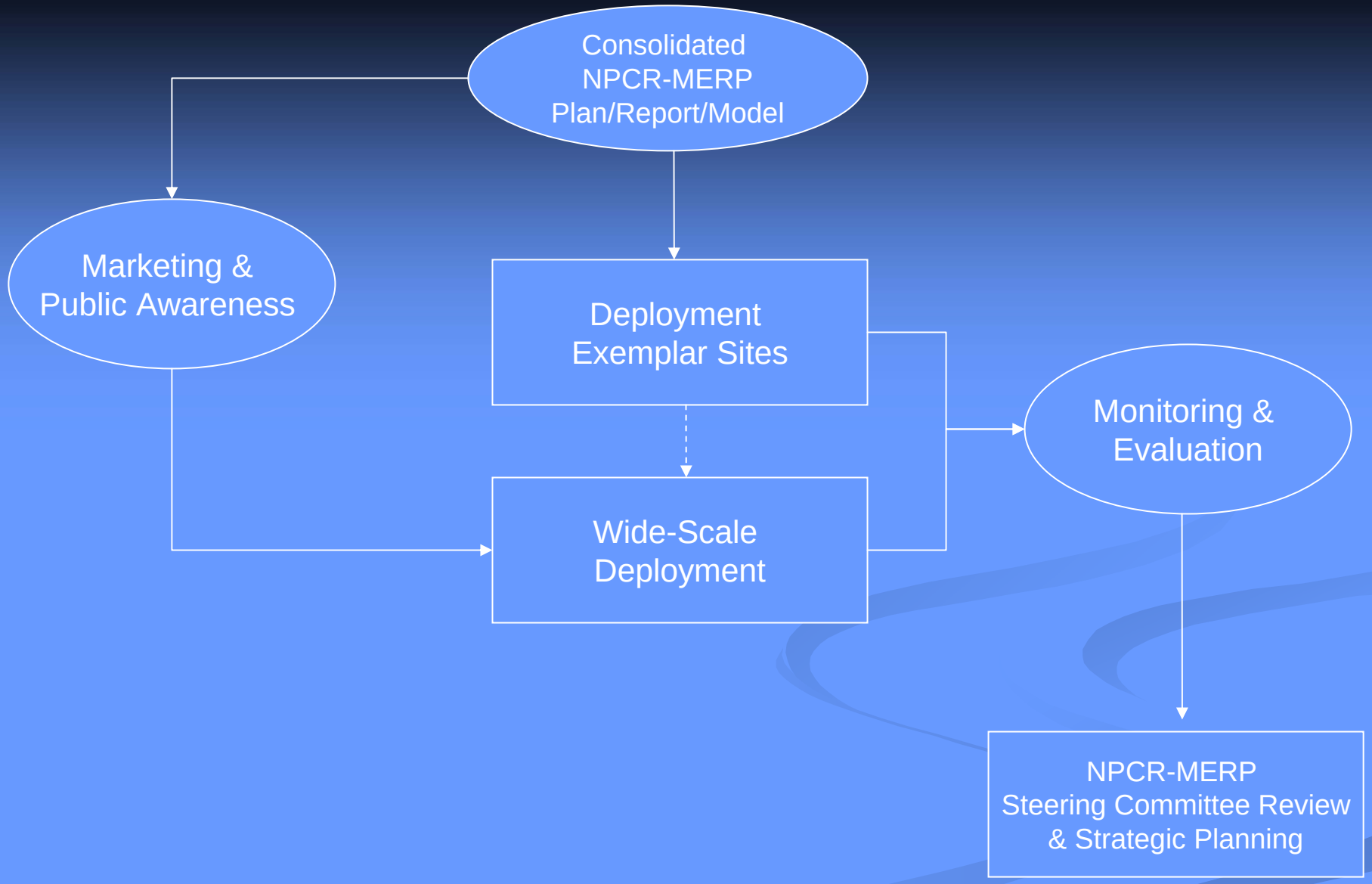
Stakeholders

- Internal Cancer Surveillance System Stakeholders
  - Hospital Cancer Registrars
  - State Central Cancer Registrars
  - Health Plans
  - Health Providers (e.g., Pathologists, Radiologists, Oncologists, etc.)
  - Cancer Epidemiologists
  - Cancer Prevention and Health Promotion Professionals
  - Cancer Program Policy Makers
  - Cancer Subject Matter Experts
  - Professional Cancer Related Interest Groups
  - Professional Cancer Societies (NAACCR, CoC, ACS, etc.)
  - State and Local Health Department Cancer Control Programs
  - Public Health Organizations
  - National Cancer Prevention and Control Programs (DCPC, NCI, etc.)
  - Cancer Industry Standard Setting Organizations
  - International Cancer Surveillance Community
  - Cancer Researchers (Genomics, Clinical Trials)
  - Private Vendors (e.g., Cancer Registry Software Developers)
- External Cancer Surveillance System Stakeholders
  - General Public
  - Senior Public Health Policy Makers
  - Legislative Representatives
  - National Health Informatics Leadership (PHIN, NHII, NHIN, ONCHIT, etc.)
  - Standard Setting Organizations
  - Academic Institutions
  - Researchers
  - Private and Public Health Foundations

NPCR

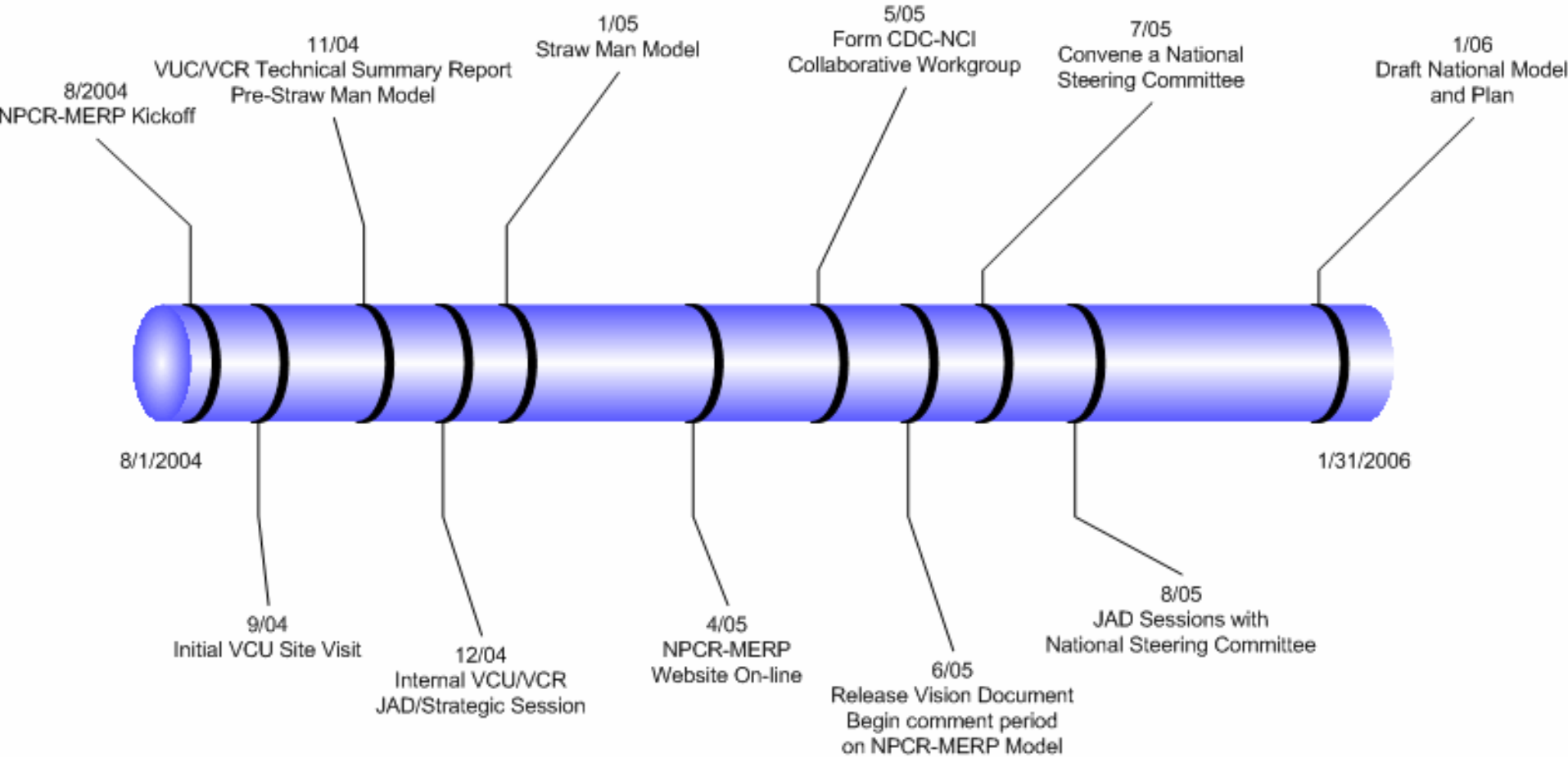
CDC
Centers for Disease Control and Prevention


CDC-NCI Collaborative Workgroup
NPCR-MERP Project Team
NPCR-MERP Steering Committee
NPCR-MERP Planning Sub-Committees/Workgroups
Informatics * Science & Research * Needs Assessment * Implementation * Operations
Information Technology Plan
Science & Research Plan
Assessment Plan
Implementation Plan
Operations Plan
Consolidated NPCR-MERP Plan/Report/Model


Consolidated NPCR-MERP Plan/Report/Model
Marketing & Public Awareness
Deployment Exemplar Sites
Wide-Scale Deployment
Monitoring & Evaluation
NPCR-MERP Steering Committee Review & Strategic Planning

NPCR-MERP Timeline

Wednesday, April 27, 2005



Future Steps

- Web-site – Status and mechanism for public input – to be determined
- MERP Listserve
- Formation of the CDC-NCI Collaboration Workgroup
- Formation of Steering Committee
  - Report
  - National Model