

Challenges in System Integration in Public Health

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Objectives

- To identify challenges faced by NYC in its integration of childhood lead and immunization registries
- To discuss strategies for overcoming these common challenges

Integration Project

- Create a Master Child Index (MCI)
 - a NYC Child Health Registry
- Integrate Data from:
 - ◆ Citywide Immunization Registry (CIR)
 - ◆ Lead Quest Registry (LQ)
 - ◆ Vital birth records
 - ◆ (~ 125,000/yr)

Rationale for Integration of the Registries

- CIR and LQ target same population
 - ◆ All NYC children - primarily ages 0-7 years
- CIR and LQ now separate systems:
 - ◆ Difficult to relate data for same child across systems
 - ◆ Missed opportunities for identifying children in need of immunizations and/or lead blood level screening
 - ◆ Providers have access to CIR immunizations but lack access to blood lead level tests

Citywide Immunization Registry (CIR)

- Contains demographics and immunizations of children up to 21 years of age
- Contains > 1.5 million children and > 11.6 million immunizations

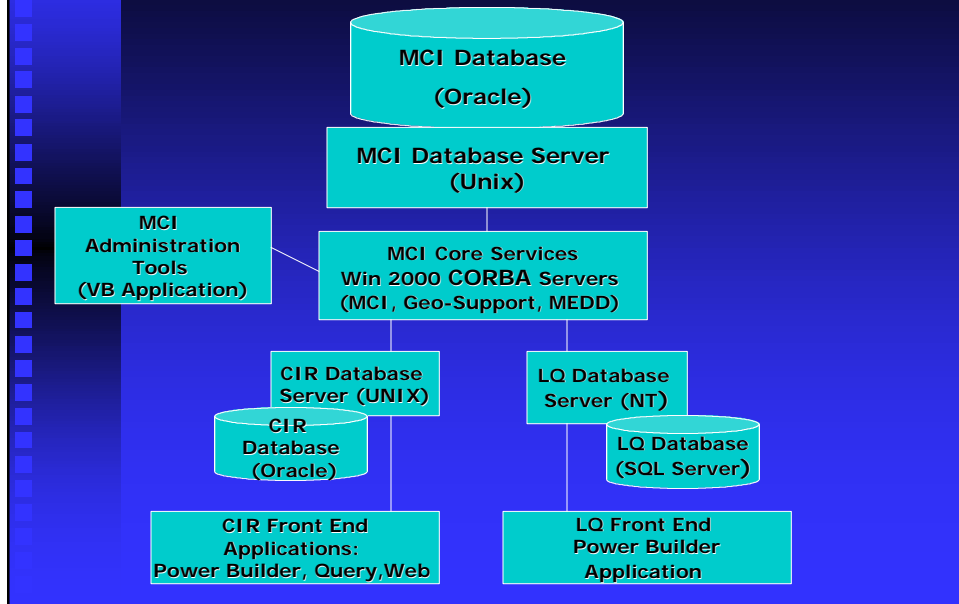
Lead Poisoning & Prevention Registry: Lead Quest

- Contains demographics, blood lead level test results and case events of children up to 18 years old
- Contains ~ 1.7 million children and > 3.9 million blood lead level tests

MCI Project Participants

- **Vendors**
 - ◆ HLN Consulting - CIR vendor
 - ◆ DSI – LQ vendor
 - ◆ Choicemaker Technologies – “MEDD” record de-duplication program
- **NYC DOH programs and offices**
 - ◆ Citywide Immunization Registry
 - ◆ Lead Poisoning and Prevention Program
 - ◆ Surveillance and Epidemiology
 - ◆ MIS
 - ◆ Others - Vital Statistics, Immunization, Health Care Access

Master Child Index



Current Project Activities

- Developing the MCI Core Services
- Interapplication Communications - CORBA
 - ◆ Core business rules
 - ◆ Identify and retrieve records
 - ◆ Add, delete, modify, update records
 - ◆ MCI administration & security tools
 - ◆ MEDD: Record Matching & merging program
 - ◆ Geosupport: Address Geocoding program
- Creating MEDD training data:
 - ◆ CIR & LQ staff human reviewing pairs
 - ◆ MEDD will learn human merging rules
- Geocoding CIR addresses (~3-4 million)
- De-duping CIR records

Remaining MCI Tasks

- Develop MCI core functions & services
- Load initial data from CIR & LQ
- Develop query & admin tools
- Synchronize CIR & LQ into MCI
- Generate MCI ID's for linking registries
- Deploy MCI
 - ◆ Early 2002

Challenges

- **Organizational:** Multi-vendor and multi-DOH program project
- **Technical:** Selection of Middleware software used to allow systems to communicate given a heterogeneous computing environment
- **Operational:** Integrating but maintaining "business as usual"

Organizational Challenges

- Two DOH programs
- Three vendors
- Two existing childhood registries
 - CIR & LQ
- Large core group ~20 – with differing objectives for MCI
- Devoting sufficient DOH program staff and resources – given other commitments

Key Issues

- Synchronizing all the sub-teams
- Differences in vendor work styles
- Leveraging the strengths - while minimizing the impact of the weaknesses - of each participating organization
- Holding each vendor accountable for their own work
- Management by consensus

Strategies

- Lots of meetings!
 - ◆ Bi-weekly project status meeting
 - ◆ Weekly DOH cross-program meeting
 - ◆ Frequent business rules or small team meetings
 - ◆ “Vendor-only” meetings

Strategies (continued)

- Technology Assistance
 - ◆ Detailed project website
 - ◆ Various e-mail distribution lists
 - ◆ Separate development environments for each vendor
- Bi-weekly status reports from vendors
- Detailed meeting minutes circulated and posted

Strategies (continued)

- Unified project management from DOH
- Separate contracts and budgets for main 2 vendors
- Joint project plan and timetable
- Joint deliverables where appropriate

Operational Challenges

- Existing systems in production during this project
- One existing registry (CIR) is undergoing major functional enhancements and server platform migration
- New, unknown tasks and responsibilities likely to emerge

Strategies

- Use same vendors for integration project as those supporting/developing existing systems
- Carefully synchronize project plans
- Develop in phases
- Plan for new functions and activities

Technological Challenges

- CIR & LQ contain different data elements - need for common MCI data elements
- CIR & LQ apply different business rules to matching/updating records - need for common MCI rules
- Heterogeneous hardware and software used by CIR and LQ – need for “middleware software” to allow systems to communicate

Key Issue and Strategies

- Selection of Middleware software
 - ◆ Established criteria for products
 - ◆ Identified candidate technologies
 - ◆ Researched products
 - ◆ Contacted references –users
 - ◆ Set-up product test beds for experimentation

Middleware Software Outcome: Key to Integration

- CORBA selected due to:
 - ◆ Multi-language support for best future compatibility and flexibility
 - ◆ Existence of CORBA Med specification
 - ◆ Product maturity
 - ◆ Compatible with good security practices

Strategies

- Lots of meetings!
- Leverage existing products and standards
- Be open to new ideas
- Leverage strengths of vendors and programs
- Develop explicit criteria for deliverables

Conclusions

- Important to maintain program involvement and support on an integration project
- Because a project of this complexity is risky, fact finding and consensus building are vital to its success
- Important to stay focused on project goals while maintaining flexibility and openness to new ideas