National Information Exchange Model (NIEM)

Executive Introduction for HITSAC June 16, 2011

Paul Embley
National Center for State Courts

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NIEM Historical Perspective

- NIEM was Launched on February 28, 2005, through an agreement between the U.S. Departments of Justice Homeland Security
- Based on the successful Global Justice XML Data Model (GJXDM)
- Expanded after its first release by additional communities of interest (domains)
- Included in the Implementation Plan of the Information Sharing Environment (Counter Terrorism Intelligence Organization)
- Tested by DOJ, DHS and states/local governments
- Information available at www.niem.gov

NIEM IS:

- A data standard
  - with agreed-upon terms, definitions, and formats.
- Independent of the way data is stored in individual systems.
- A way to achieve consensus on the content of specific exchanges
- A structured approach to data interoperability

NIEM Tools and Support Services

- **Documentation**
  - ***Introduction to NIEM***
  - ***Concept of Operations***
  - ***User Guide***
  - ***Naming and Design Rules***
- **Standards**
  - **NEIM 1.0**
  - **Documentation specs**

All available through www.niem.gov

- **Training and Technical Assistance**
  - **NIEM website**
  - **Training materials**
  - **Help desk and knowledge base**
  - **National and regional training**
- **Tools**
  - **Automated documentation generator**
  - **Tools to browse the model**
  - **IEPD Clearinghouse**

Participating Communities and Governance

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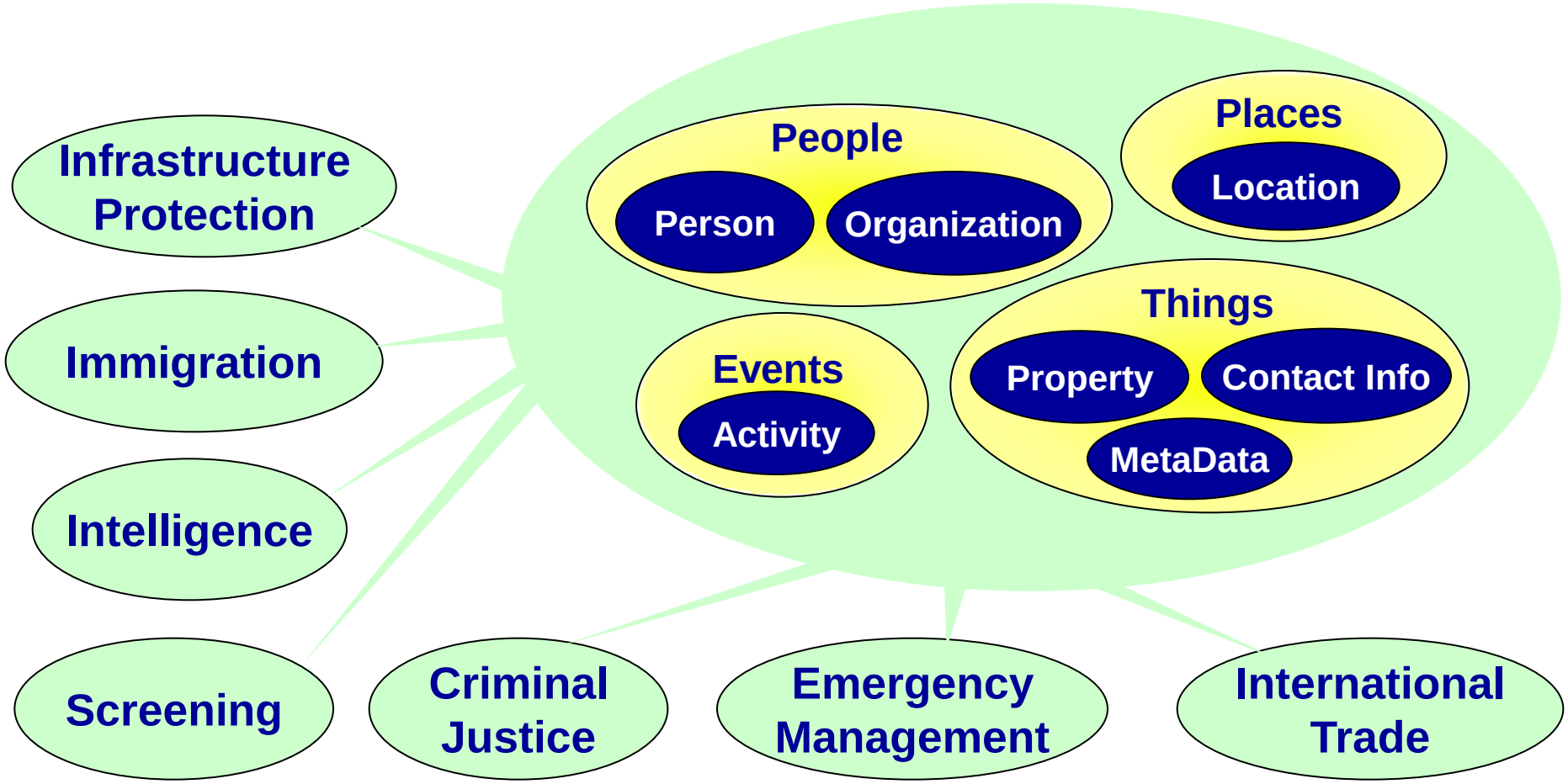
Defining Data Components

Defining data components unique to a domain is done by subject matter experts who are representatives of the domain following basic rules for definitions and terms

A governance body representing all participating domains defines those data components that are universal or commonly used by more than one domain using the same basic rules

NIEM at 50,000 Feet



NIEM Origins (XML Enabled)

- **Governance**
  - NIEM Executive Steering Committee (DOJ, DHS, DNI and GAC)
  - Global Advisory Committee (GAC) - FACA advisory body to U.S. Attorney General; Comparable to HHS AHIC; local, state and tribal voice on justice and public safety information sharing and integration issues

- **Medium**:
  - Extensible Markup Language (XML)
  - Data Model (Based on Global Justice XML Data Model or GJXDM)

- **Global Justice XML Origins:**
  - State and Local Courts
  - Criminal History Records (Rap Sheets)
  - and State/Local Intelligence Communities

Global Advisory Committee (GAC)

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- Membership (30 Organizations representing local, state, tribal, federal and international communities)
  - Law Enforcement Agencies
  - Prosecutors, public defenders and courts
  - Corrections Agencies
  - Probation and Parole Departments
  - Victim Services
  - State and Local Intelligence
  - Native Americans
  - Interpol
  - State Legislators
  - Attorneys General
  - Homeland Security
  - Drug Enforcement Agency
  - Chief Information Officers
  - Motor Vehicles
  - Juvenile Justice

GAC Working Groups

- Security
  - Measures, Guidelines, and promising practices
  - Federated privilege and identify management
- Privacy and Information Quality
  - Privacy policy development guide and implementation templates
  - Information quality assessment tools
  - Training and technical assistance; technology to support privacy policies
- Infrastructure/Standards
  - Global Justice XML Data Model (GJXDM) and NIEM
  - Justice Reference Architecture (JRA) based on OASIS Standards and SOA Principles
- Criminal Intelligence
  - National Criminal Intelligence Sharing Plan
  - Fusion Center Guidelines
- Outreach

Private Sector Partner: IJIS Institute

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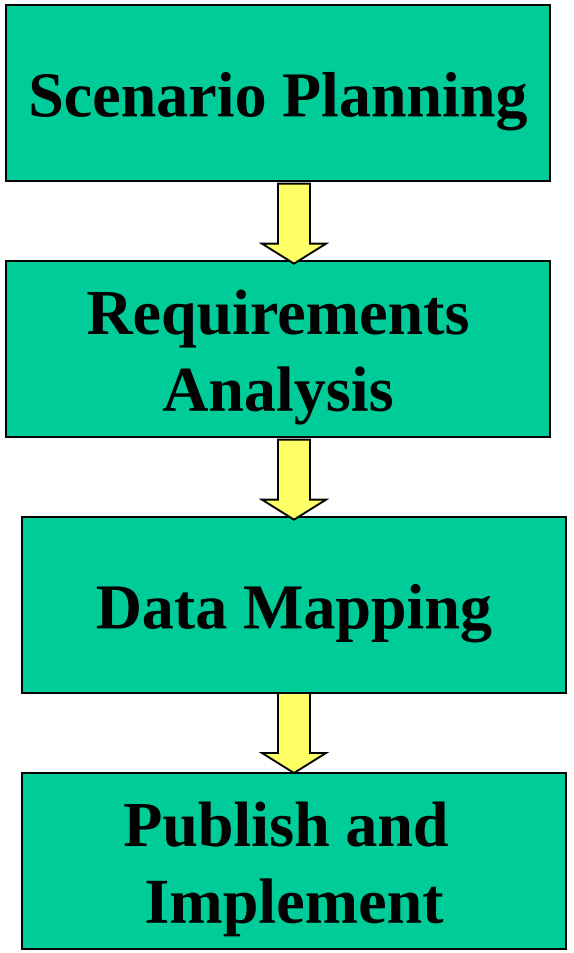
- Public/private sector partnership
- Non-profit consortium of nearly 200 companies that supply I.T. solutions and services to the justice, public safety and homeland security sectors
- Funded by industry contributions and federal grants
- Links resources of industry to interests of government to improve the systems that provide critical information to justice and public safety professionals that protect and serve our communities
- Functions:
  - Training -- National Scope Issues
  - Technical Assistance -- Communications and Outreach
  - Help Desk/Knowledge Center -- Program Management
- FY 2006: 255 Volunteers; 17,000 Person Hours

Information Exchanges Help Do The Job

- Exchanges using a national standard make it easier to:
  - Forward incident and arrest data from police to prosecutors
  - Determine the status of beds, staff, and resources at hospitals
  - Send call data from a 9-1-1 center to multiple dispatch centers
  - Report suspicious activities from field officers to investigators at state and national levels and from one fusion center to another
  - Report the status of emergency response teams and resources
  - Screen persons or cargo entering the country

How NIEM Works to Support Information Sharing

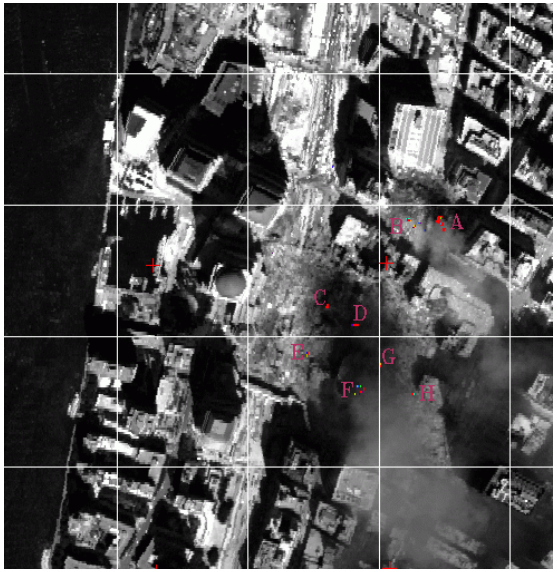
- Develop a scenario that defines the need for information sharing between organizations
- Define the requirements including the data components that should be included
- Use the data component standards from NIEM to design the information exchange package, extending them where needed (IEP)
- Document the exchange (IEPD)
- Store in a repository and implement the exchange



Scenario-Based Planning

- Building Collapse: The result of…
  - Terrorist Incident
  - Natural Disaster
  - Large Scale Criminal Event
  - Catastrophic Structural Failure

- Will trigger a broad range of information exchanges across many domains:
  - Law Enforcement
  - Fire Services
  - Emergency Medical Services
  - Disaster Management
  - Environmental
  - Public Works
  - Private Industry
  - Etc.



Identify Information Exchanges

The scenario describes in narrative form an operational situation, business context, legislative, judicial or executive mandate, or other circumstance which must be addressed. From this scenario individual, discrete information exchanges are identified for subsequent analysis.

Exchange 1:
The EOC dispatches police, fire units, and emergency medical personnel.

Exchange 2:
First responders arriving on scene begin reporting back to the EOC on the nature and scope of the damage.

Exchange 3:
Initial injured are assessed, and information is forwarded to area hospitals via devices that are tracking hospital capacities, services available, and patient transports.

Hospital Availability Pilot Information Exchange Package (IEPD)

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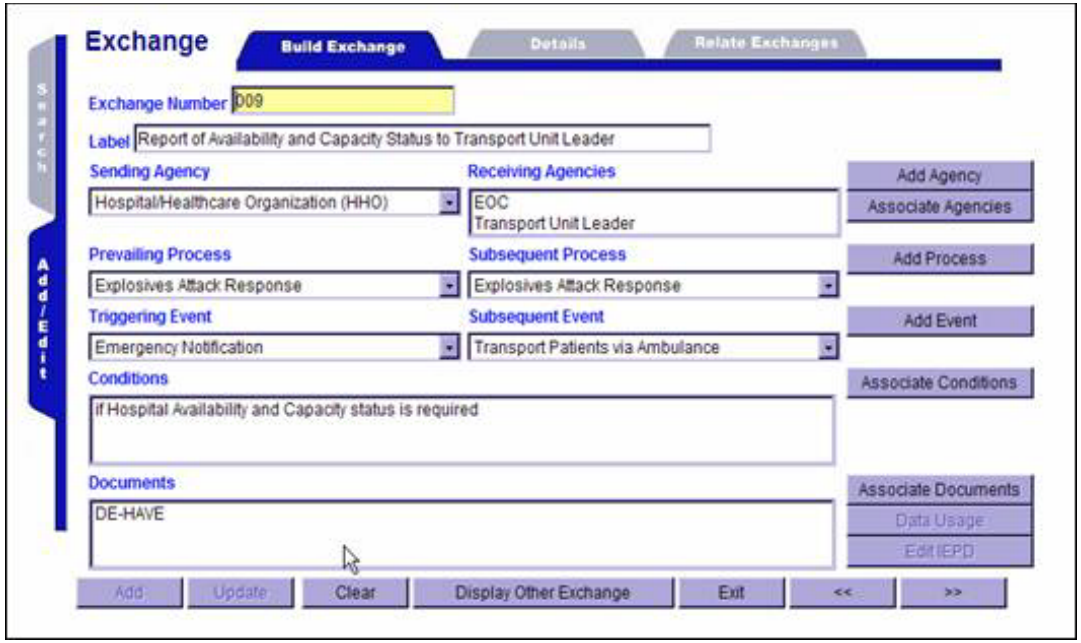
DHS pilot project executed by
SEARCH and Georgia Tech Research Institute (GTRI)

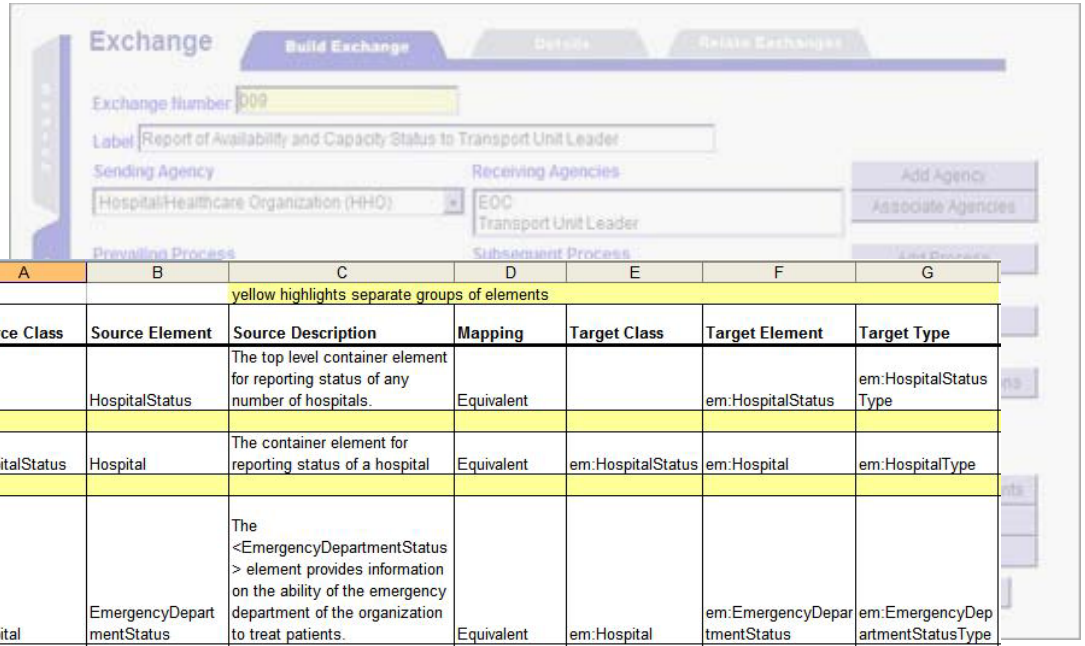
1. Modeled exchange requirements based on OASIS specification and National Planning Scenarios



Hospital Availability Pilot IEPD

DHS pilot project executed by SEARCH and GTRI

1. Modeled exchange requirements based on OASIS HAVE specification and National Planning Scenarios
2. Mapped to NIEM

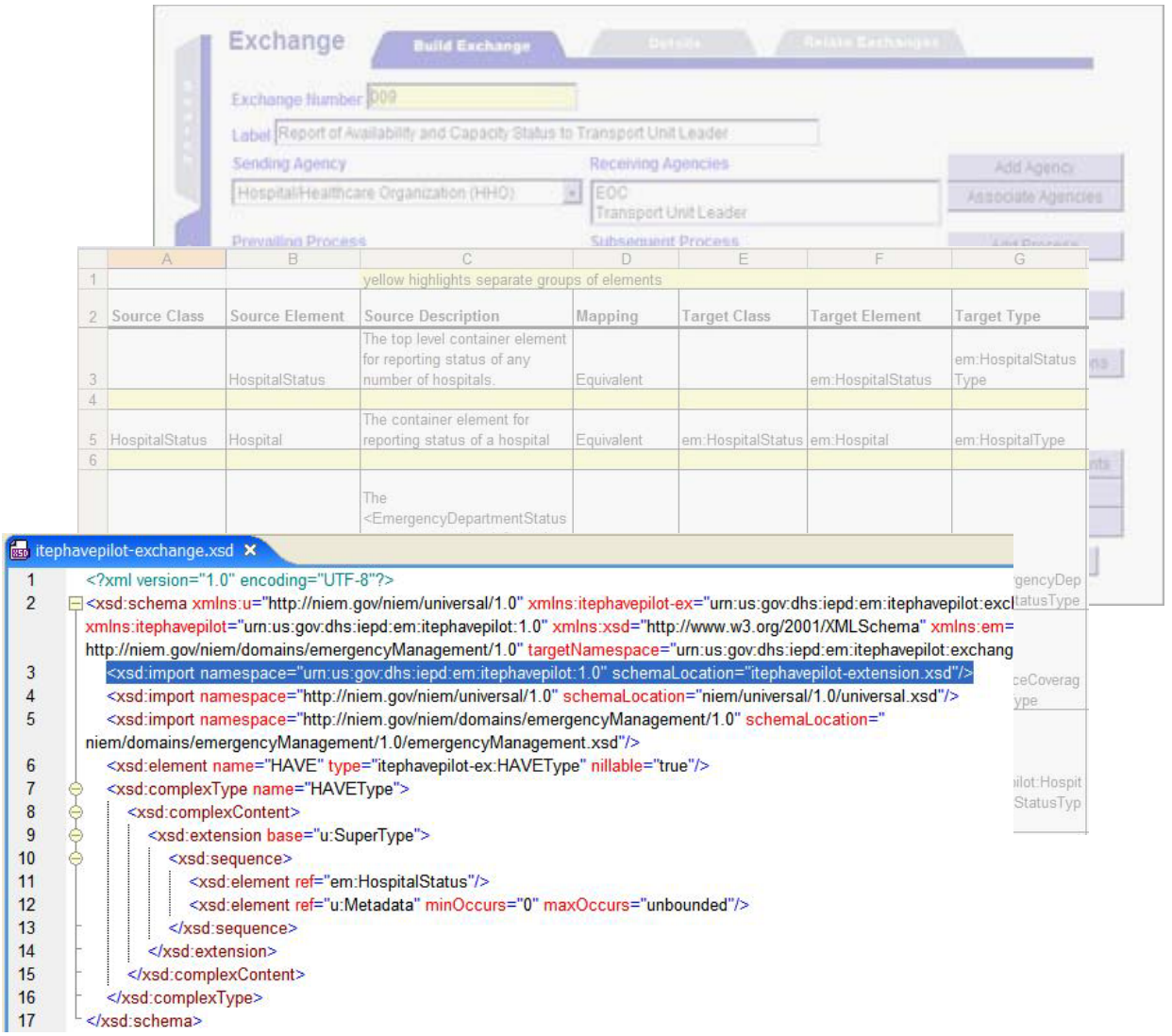


	A	B	C	D	E	F	G
1			yellow highlights separate groups of elements				
2	**Source Class**	**Source Element**	**Source Description**	**Mapping**	**Target Class**	**Target Element**	**Target Type**
3		HospitalStatus	The top level container element for reporting status of any number of hospitals.	Equivalent		em:HospitalStatus	em:HospitalStatusType
4							
5	HospitalStatus	Hospital	The container element for reporting status of a hospital	Equivalent	em:HospitalStatus	em:Hospital	em:HospitalType
6							
7	Hospital	EmergencyDepartmentStatus	The <EmergencyDepartmentStatus> element provides information on the ability of the emergency department of the organization to treat patients.	Equivalent	em:Hospital	em:EmergencyDepartmentStatus	em:EmergencyDepartmentStatusType
8	Hospital	ServiceCoverageStatus	The container element of all the elements of service coverage. This includes both the necessary staff and facilities.	Equivalent	em:Hospital	em:ServiceCoverageStatus	em:ServiceCoverageStatusType
9	Hospital	HospitalFacilityStatus	The container of all of the elements related to the status of the facility.	Equivalent	em:Hospital	itephavepilot:HospitalFacilityStatus	itephavepilot:HospitalFacilityStatusType

Hospital Availability Pilot IEPD

DHS pilot project executed by SEARCH and GTRI

1. Modeled exchange requirements based on OASIS HAVE specification and National Planning Scenarios
2. Mapped to NIEM
3. Resulted in NIEM-conformant IEPD that describes the status of a hospital, its services, and its resources:
   - bed capacity and availability,
   - emergency department status,
   - available service coverage,
   - the status of a hospital's facility and operations.



Proof of Concept and Success

- AMBER Alert has helped rescue more than 230 children nationwide.
- National Law Enforcement Telecommunications Systems (NLETS) transactions based on Global JXDM and NIEM
- Ohio police officers can search 600 separate police computer systems
- In Maricopa County, AZ, a web service automatically sends arrest information from the police to the prosecutor
- In central Florida, 700 offenders were jailed over 12 months due to automated information sharing of data among 150 agencies
- Hundreds of cases have been solved due to the timely availability of data

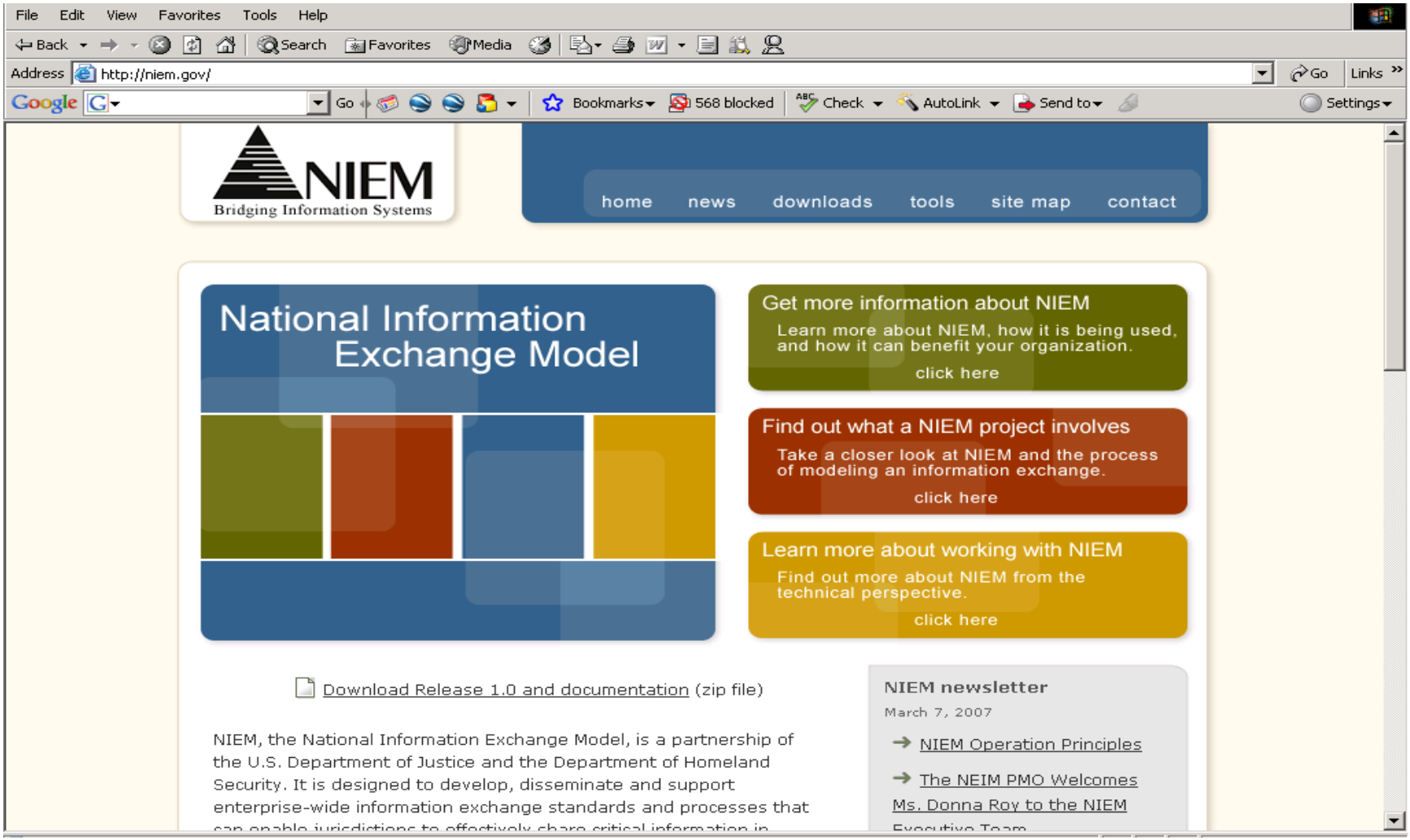
Lessons Learned From Past Experience

- All exchanges should be derived from operational needs for information
- Subject matter experts should be used to define the requirements for each information exchange from the beginning
- The right enterprise architecture is critical to success
- Maximize the use and application of existing standards for information sharing, particularly open standards such as XML, web services, etc.
- Build on past successes in comparable jurisdictions
- Seek advice from technical experts to design exchanges once the operational requirements are determined

NIEM Adoption

- OASIS Electronic Court Filing Technical Committee plans a 2008 release of IEPDs conformant with NIEM
- RFPs have been released to develop NIEM IEPDs for Fusion Centers
- DOJ and DHS grant language requires use of NIEM
- California is converting their Court Case Management System interfaces to NIEM
- Connecticut is building a metadata repository covering GJXDM and NIEM elements and definitions as a state standard
- NY State is utilizing NIEM to convert CJIS transactions
- NY State and NLETS are actively developing a NIEM Criminal History Pilot
- Florida is utilizing NIEM for all law enforcement information exchanges

NIEM Web Site



Next Steps

- Use NIEM for information exchanges to achieve interoperability
- Design and implement the exchanges using web services
- Use NIEM tools to develop exchange documentation
- Adopt a service oriented architecture for information systems
- Train more developers
- Identify key exchanges with other organizations

Possible Justice/Health Exchanges

- Health records for inmates sentenced to corrections facilities and then released back into the community
- Mental commitments by courts
- Drug court actions and court diversion programs
- Emergency transportation of accident victims to hospitals
- Health disease issues
- Sexually transmitted disease information from jail inmates
- Prescription Drug monitoring
- Court ordered physical or mental evaluations
- Medicaid or Medicare fraud
- Death Notifications

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What Business Are We In?
An Enterprise Approach to Health and Human Services

U.S. Department of Health and Human Services
Administration for Children and Families
Washington, DC
May 20th, 2010
Handout Version

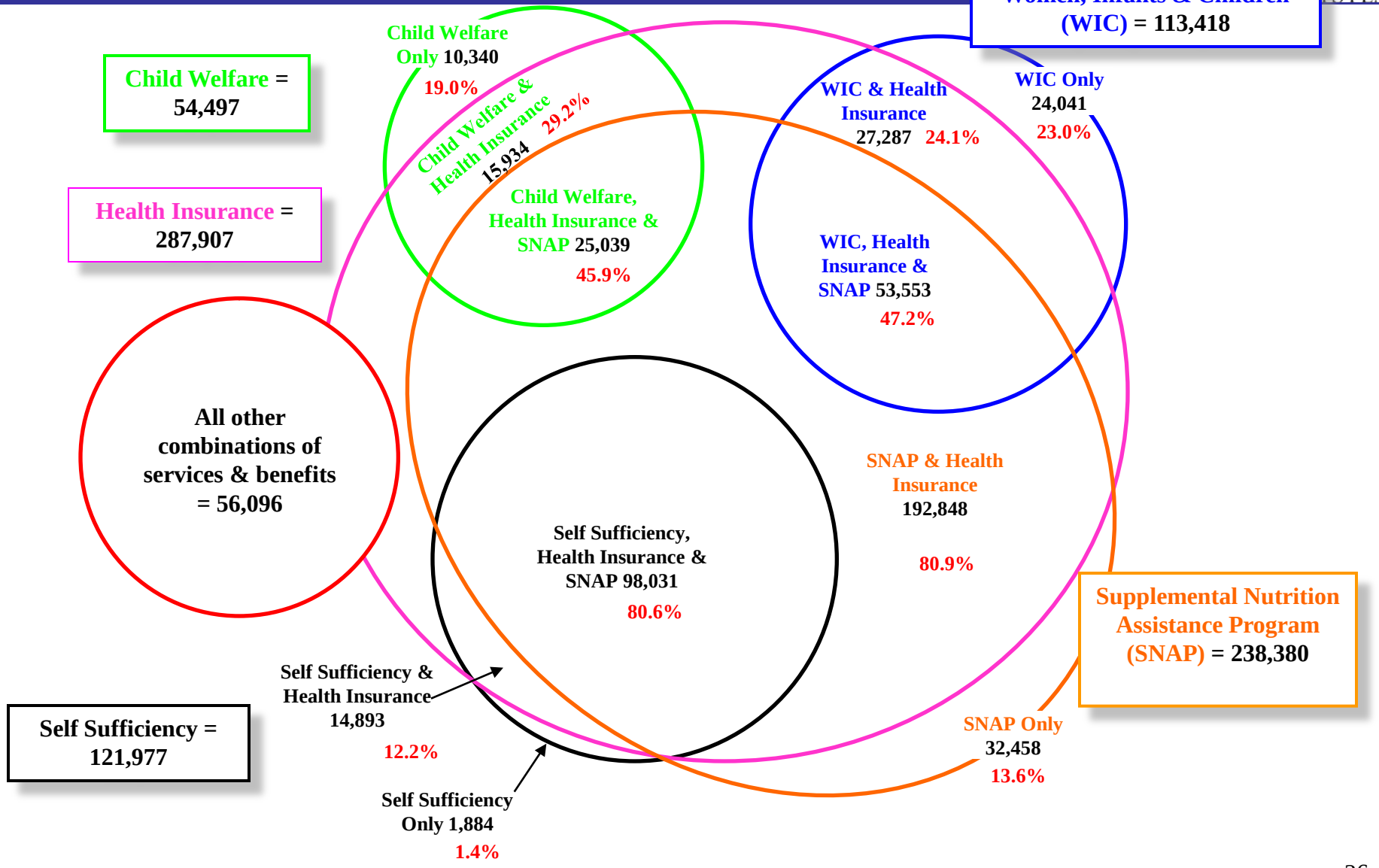
Rick Howard, CIO
Oregon Department of Human Services

Information Sharing

Perhaps it is our fate to live at the historic juncture where our agencies of information accumulate enough data to complicate matters but have not yet advanced to the point where they can resolve the complications they introduce.

William Barrett, *Time of Need: Forms of Imagination in the Twentieth Century*.

Program Overlap: Children in 2003 (380,439)



Siloed Architectures in a Siloed World

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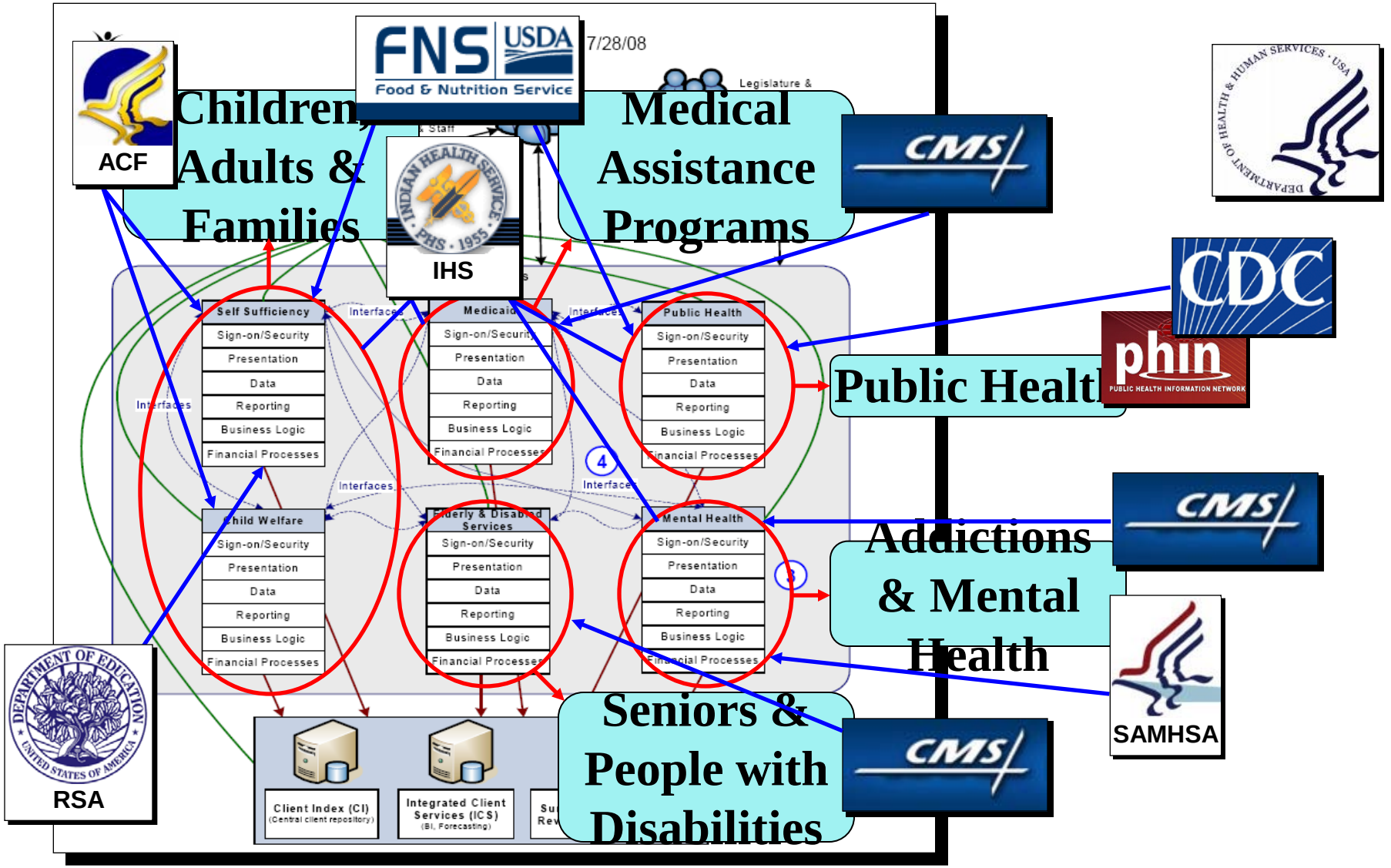
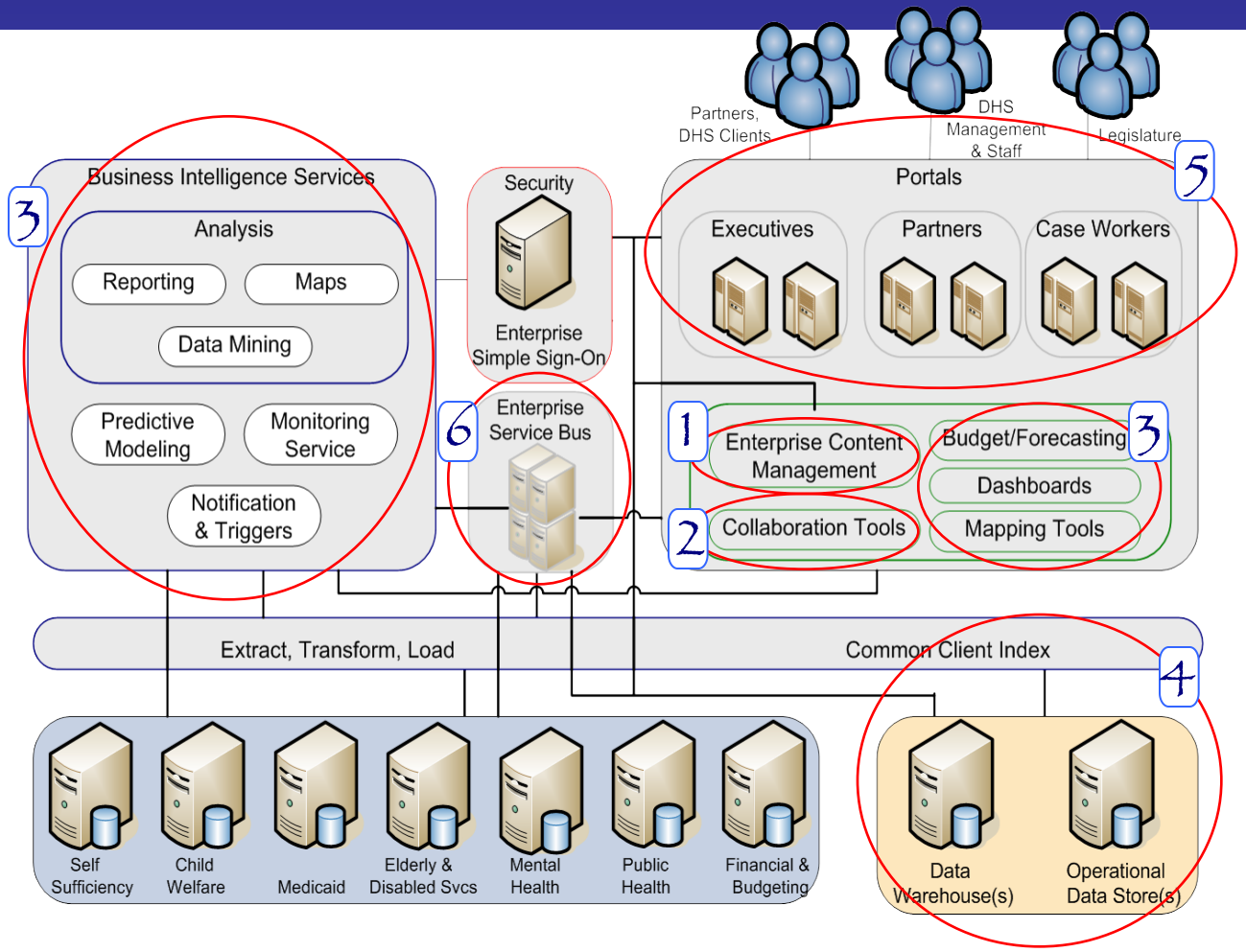


Expanding Enterprise Capabilities



2015 Technology Plan
Enterprise Capabilities

1. **Enterprise Content Management**
2. **Collaboration**
3. **Decision Support System**
4. **Data Warehouses & Data Stores**
5. **Portals**
6. **Service Oriented Architecture**

***Adapted from*: Microsoft Institute for Advance Technology in Governments and Systems Engineering, Inc. (SEI). *Camellia Project: A Connected Health and Human Services Framework for Alabama*. May 2007**

The Health & Human Services Enterprise

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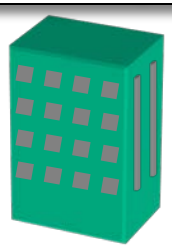
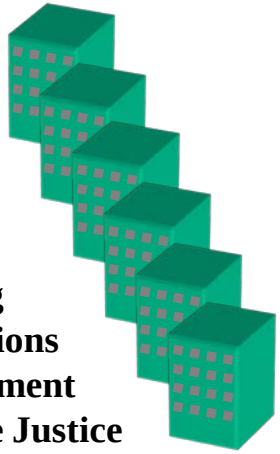
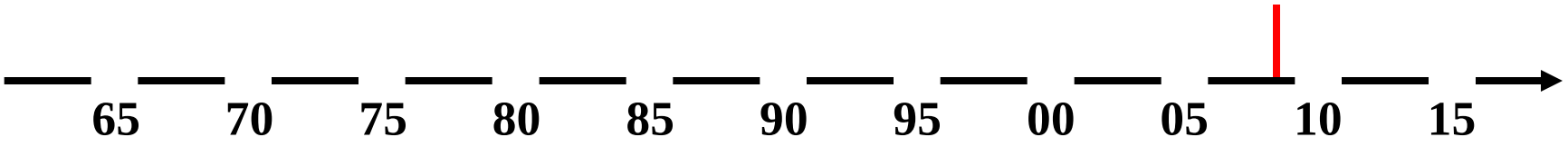
2009: Department of Human Services



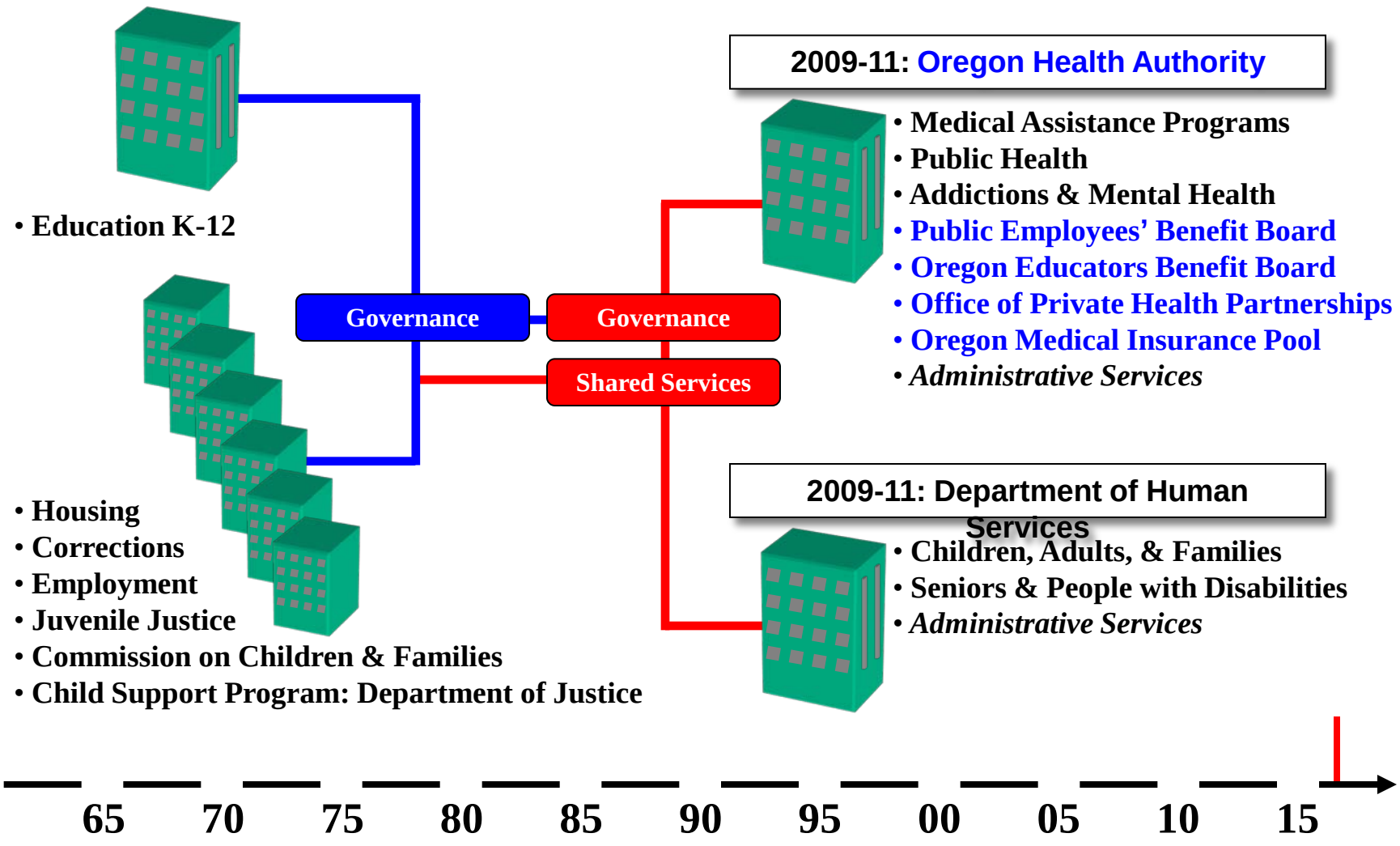
- Children, Adults, & Families
- Seniors & People with Disabilities
- Medical Assistance Programs
- Public Health
- Addictions & Mental Health
- Director's Office
- Administrative Services



- Housing
- Corrections
- Employment
- Juvenile Justice
- Commission on Children & Families
- Child Support Program: Department of Justice



The Health & Human Services Enterprise



One to Many: Sharing Among Programs

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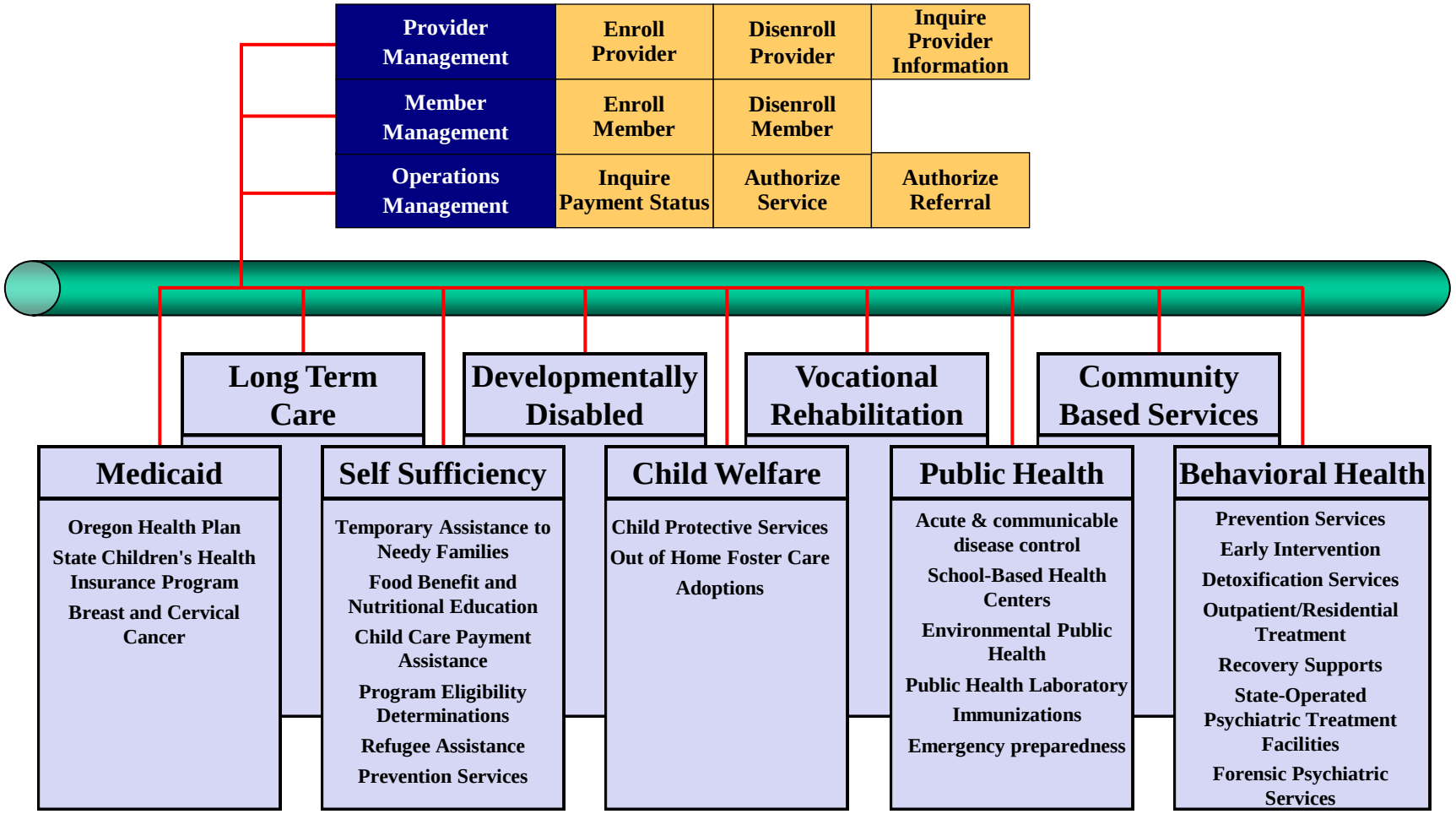

One to Many: Sharing Among Programs

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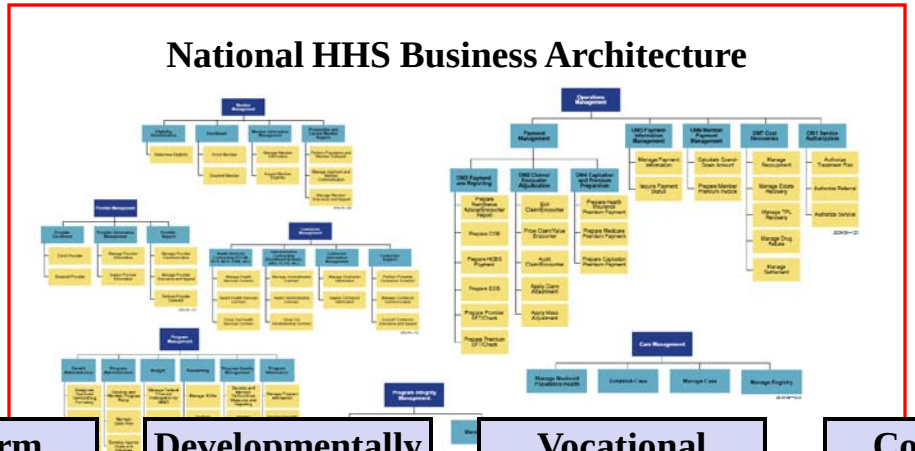
Lowers Total Cost of Ownership



Increases Total Value of Service

Long Term Care	Developmentally Disabled	Vocational Rehabilitation	Community Based Services

Medicaid	Self Sufficiency	Child Welfare	Public Health	Behavioral Health
Oregon Health Plan State Children's Health Insurance Program Breast and Cervical Cancer	Temporary Assistance to Needy Families Food Benefit and Nutritional Education Child Care Payment Assistance Program Eligibility Determinations Refugee Assistance Prevention Services	Child Protective Services Out of Home Foster Care Adoptions	Acute & communicable disease control School-Based Health Centers Environmental Public Health Public Health Laboratory Immunizations Emergency preparedness	Prevention Services Early Intervention Detoxification Services Outpatient/Residential Treatment Recovery Supports State-Operated Psychiatric Treatment Facilities Forensic Psychiatric Services

National Information Exchange Model

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Permanency and Courts

- **Primary actions and notifications that occur between the child welfare permanency and court process include:**
  - **Initiating court intervention**
  - **Submitting information to the court**
  - **Receiving and recording court orders, decisions and notifications**
- **The chart at right illustrates where sample elements needed to share this data may be found in NIEM**

	Element(s) found in NIEM Core	Element (s) found in NIEM 2.1 (Family Services Domain)	New Element(s) Needed
Initiation of Court intervention			
Petitionor identifcation		✓	
Petition details		✓	
Date of petition		✓	
Reason for petition		✓	
Type of peitition		✓	
Action requested of court			
Hearing report information			
Removal indicator and date		✓	
Custody status		✓	
Placement change reason		✓	
Role of caseworker		✓	
Child's demographic info	✓		
Caseworker information		✓	
Child welfare agency information		✓	
Parent information	✓		
Related cases		✓	
Case narrative		✓	
Assessment data		✓	✓
Service plan information			
Service plan goals		✓	
Services ordered under service plan		✓	
Recommendations			
Recommendations to court		✓	
Court orders, findings and other outcomes			
Court findings		✓*	
Court rulings		✓*	
Court orders	✓	✓*	

** Some elements also in NIEM justice domain*

***Source*: MTG Management Consultants, L.L.C., *Child Welfare Agencies and Data Exchange: Enabling More Informed Decision-making*, 2009.**

National Information Exchange Model

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Findings and Summary

- **Existing NIEM model provides excellent foundation for child welfare data exchanges**
  - **Over 90% of identified elements needed for internal child welfare and child welfare to courts exchanges can be mapped to NIEM Core and NIEM 2.1**
- **Extending elements from family service domain is expected to meet agency's data exchange needs**
  - **Example: Basic *Assessment* data elements in NIEM may need to be expanded to incorporate a wider range of information about a particular assessment, such as NCFAS**
- **Basic information exchanges can be reused between counties and child welfare agencies**

***Source*: MTG Management Consultants, L.L.C., *Child Welfare Agencies and Data Exchange: Enabling More Informed Decision-making*, 2009.**

Benefits of a National HHS BA: Public Sector

- Promotes government interoperability
- Transforms delivery of government services
- Creates person-centric systems of care
- Aligns IT with business strategies
- Increases program efficiency and effectiveness
- Adds predictability to budget development
- Lowers TCO, increases TVO of IT

Benefits of a National HHS BA: Private Sector

- Supports federal funding and APD reform efforts
- Recognizes SOA frameworks and shared IT services
- Streamlines state procurement processes
- Lowers risk and shares risk equitably
- Accelerates IT product life cycle
- Promotes innovation, healthy competition
- Emphasizes value-added services and economies of scale

Creating a National HHS Architecture

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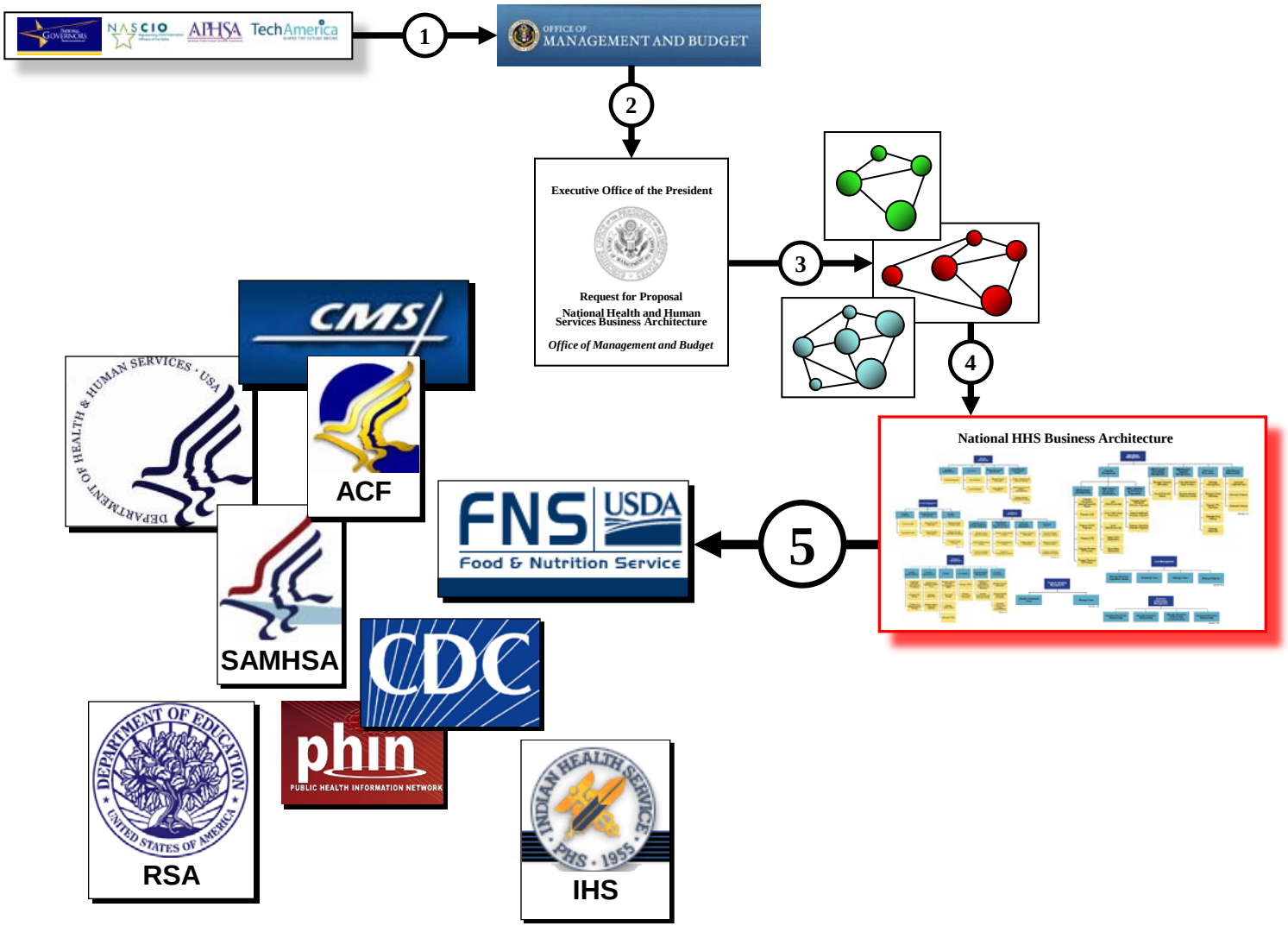

Conclusion

The need to design business operations across programs and state agencies according to a business architecture is increasing.

A business architecture isn't limited to services within one state agency or even among multiple agencies.

Most jurisdictions - federal, state and county - use business processes that can be standardized and shared at all levels of government.

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Potential for Justice and Health IT Collaboration

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