

# Project Child HANDS

## Child Care Subsidy and Early Education: Helping Analyze Needed Data Securely

Presentation to the  
Governor's Early Childhood  
Advisory Council



May 31, 2012



# Project Child HANDS

## What is it?

- A system for cross-agency linking of early childhood data for policy analysis and program evaluation
- A system that is:
  - Compliant with Federal and State Privacy Laws
  - Does not require new authorizing legislation
  - Does not require new “data center” establishment (low cost)
  - Easily expanded to include additional data partners
  - Uses compatible technologies with other state data initiatives (e.g. VA Longitudinal Data System)

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## Where did it come from?

U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research and Evaluation (Cooperative Agreement HHS-90YE0106)

### Tracking Care Assistance Program Data and Effects

- Federal program administered through state Block grants
- Work support program with increasing emphasis also on children's development
- Eligibility based on work, training and income status
- Lose work, lose child care assistance
- Birth through age 12

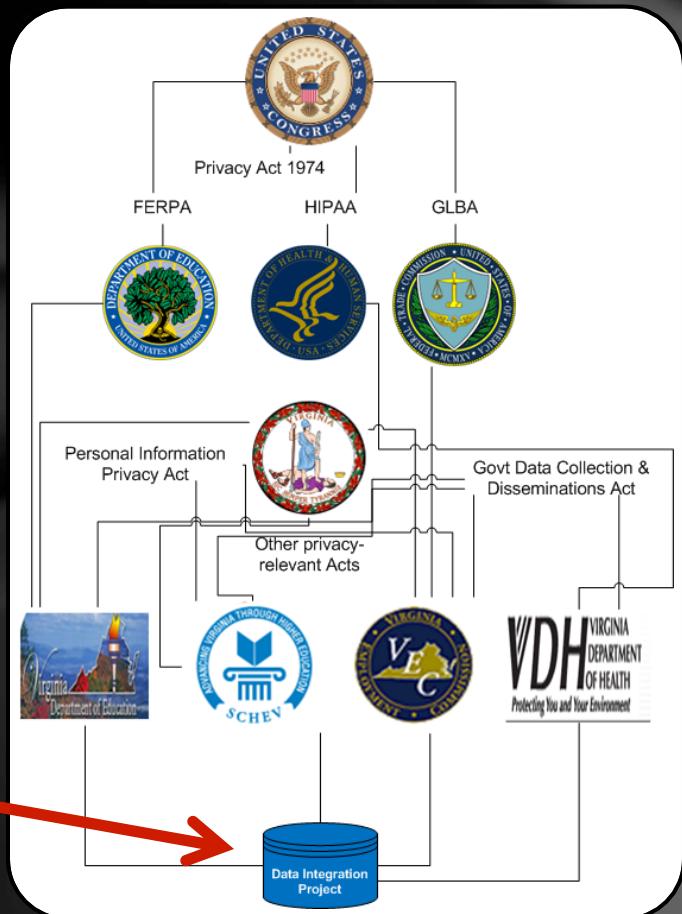
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## Technical Approach Driven by Implementation Environment

### Public Sector Statutory and Regulatory Heterogeneity

- Multiple levels of statutory law
- Multiple implementations of regulatory law at each level of statutory law
- Most conservative interpretation of regulatory law becomes de facto standard

*Trying to get all of this into a single system is where multi-million dollar cost-overruns come from!*



# Choice of Solution Models

## Instead of Identified Consolidation, De-identified Federation

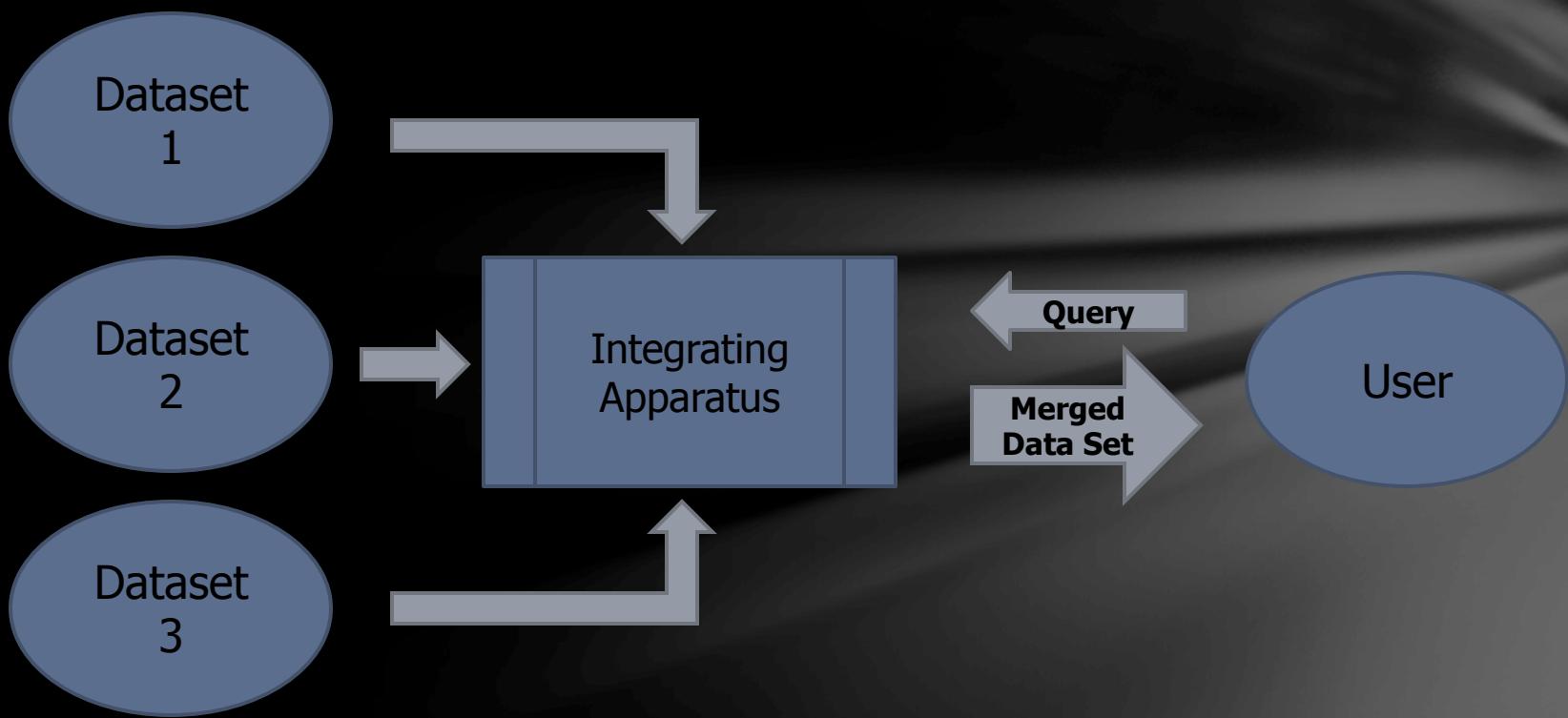
### Consolidated Data Systems (Warehouse)

- Expensive (to both build and maintain)
- Too difficult to “program” the multiple levels of federal and state statutory and regulatory privacy requirements – must have laws in place to allow for centralized collection
- Lack of clear data authority, per data system, between state agencies and between state and local-level agencies – participation is not compulsory

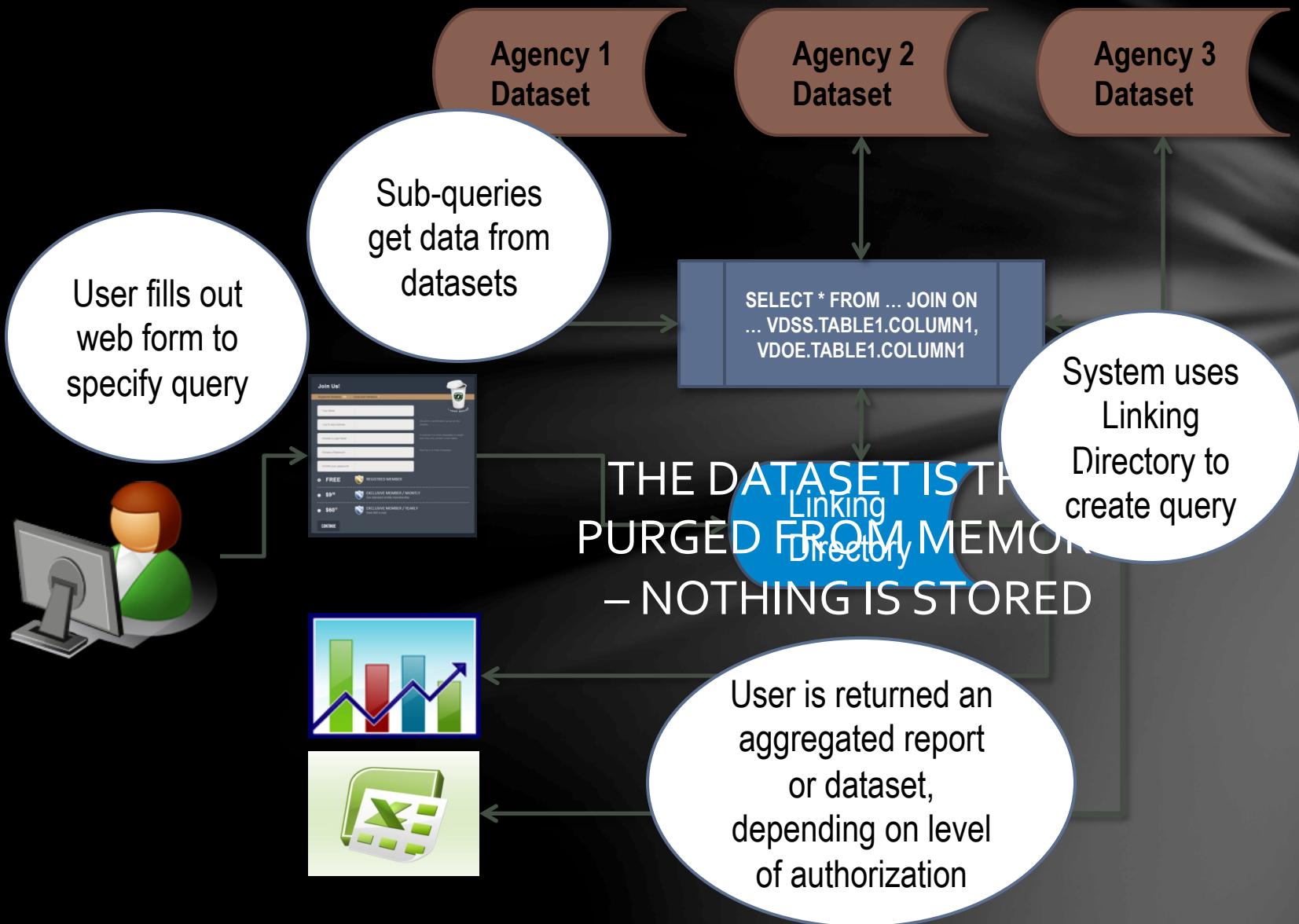
### Federated Data Systems

- System that interacts with multiple data sources on the back-end and presents itself as a single data source on the front-end
- Cheaper (much less central technology and personnel needed)
- Data authority issues minimized – federation allows for the maintenance of existing privacy protection rules and regulations
- Much less has to be programmed -- significantly reduced development time and cost

# What is a Federated Data System?



# HANDS Federated Process – Data Sets are not Retained

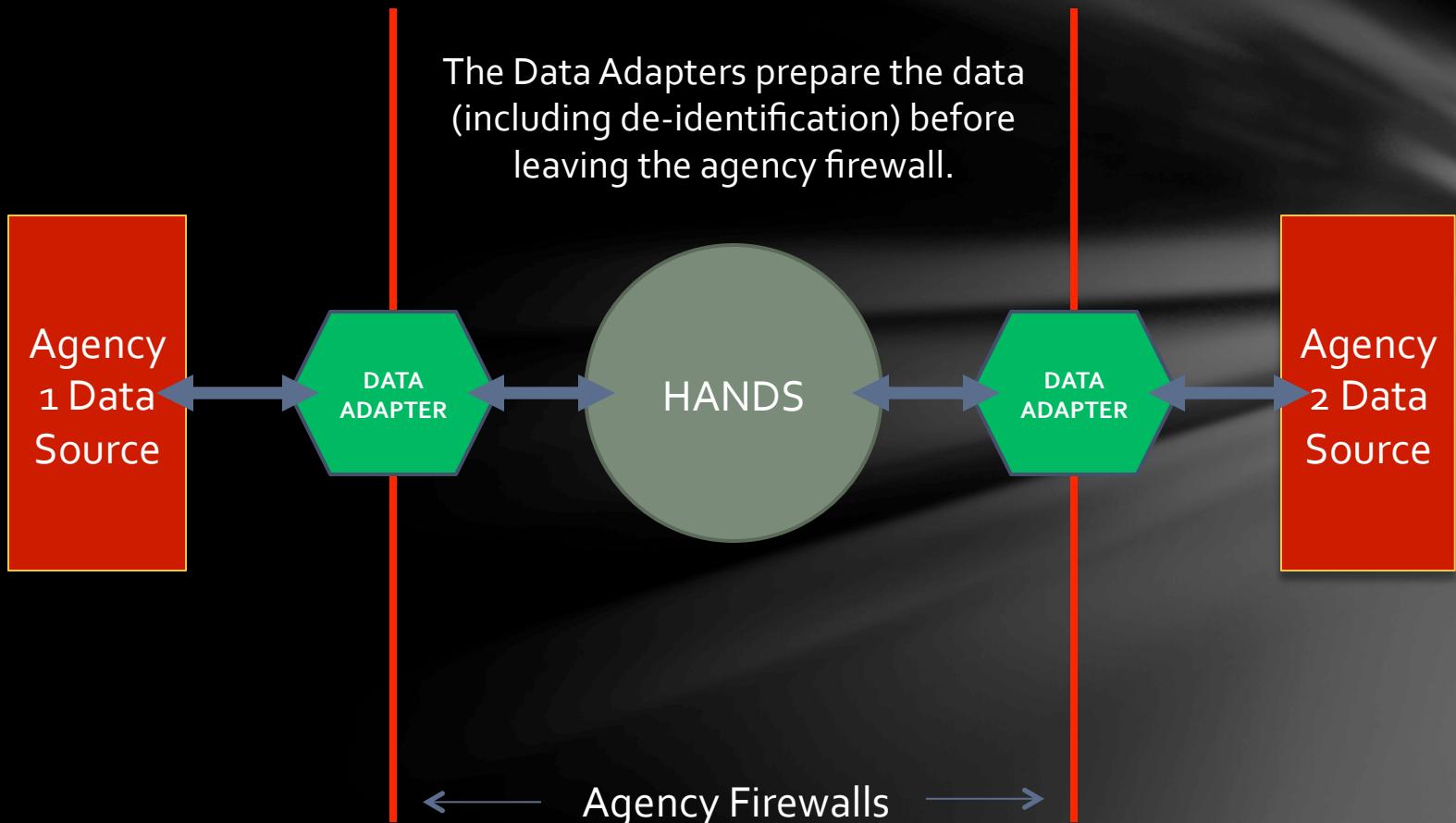


# What does the system create?

A Multi-Agency Data Set of De-Identified Virtual Child Records Or Program Records

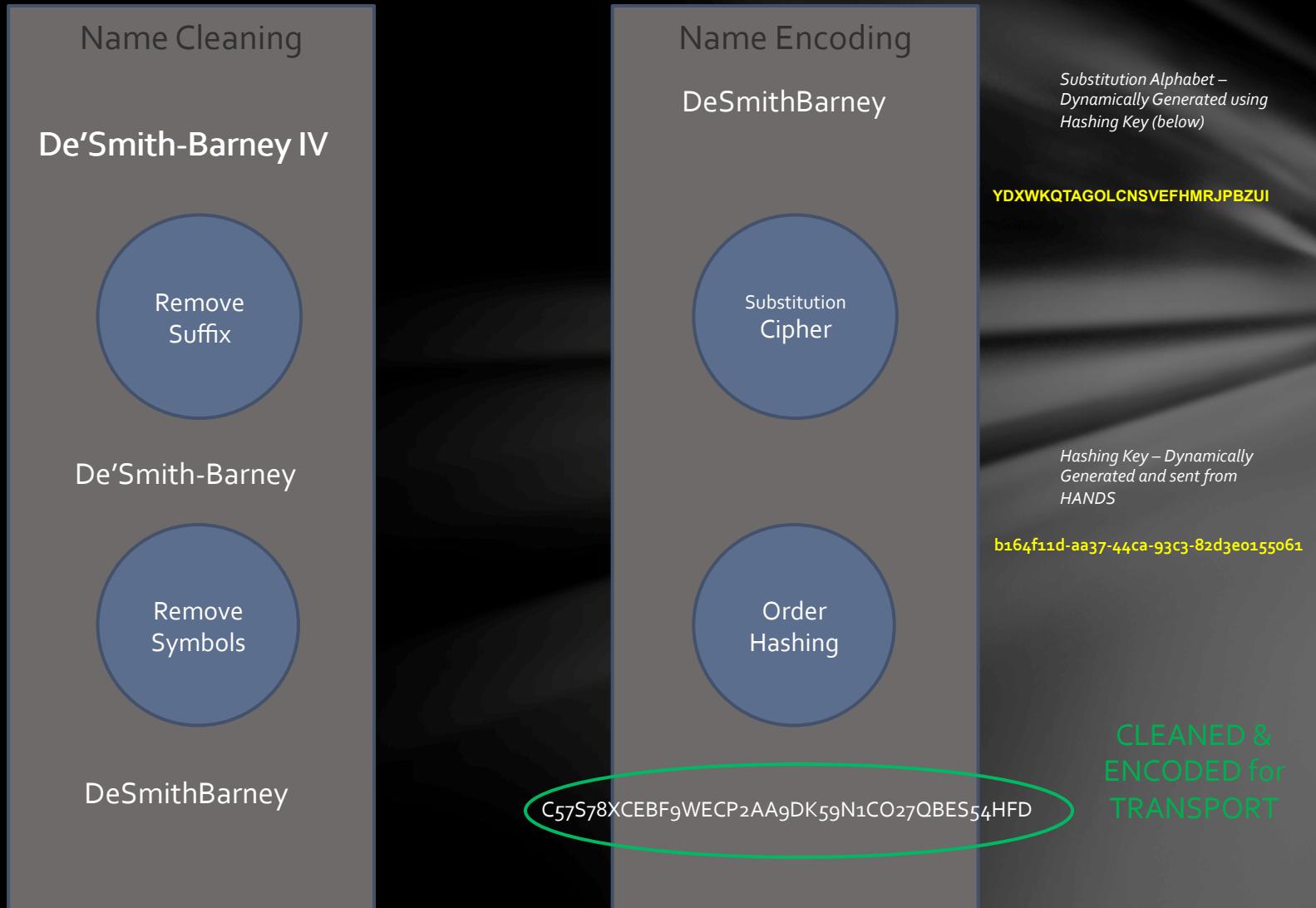
VDOE - Student Record Collection (SRC)	RESPONSIBLE DIVISION NUMBER RESPONSIBLE SCHOOL NUMBER SERVING DIVISION CODE SERVING SCHOOL/CENTER CODE ENTRY DATE RACIAL/ETHNIC CODE (PRE 2010) GENDER CODE BIRTH DATE GRADE LEVEL CODE KINDERGARTEN HALF-DAY FLAG PRIMARY DISABILITY CODE DISADVANTAGED STATUS FLAG COUNTRY OF BIRTH CODE HOME LANGUAGE CODE IMMIGRANT STATUS FLAG MIGRANT STATUS FLAG GIFTED CODE GIFTED REFERRAL FLAG TITLE I CODE AGGREGATE DAYS PRESENT AGGREGATE DAYS ABSENT RETENTION FLAG KINDERGARTEN READINESS ASSESSMENT FLAG SCHOOL CHOICE STATUS CODE SUPPLEMENTAL EDUCATION SERVICES CODE PK EXPERIENCE CODE PK WEEKLY TIME CODE RESIDENCE ZIP CODE UNEXCUSED ABSENCES FOSTER CARE FLAG ETHNIC FLAG (2010-) RACE CODE (2010-) LEP STATE CODE RECEIVING ESL SERVICES CODE PROJECTED LEP STATE CODE  DATE OF BIRTH STUDENT GENDER ETHNICITY PRIMARY DISABILITY DISTRICT NAME SCHOOL NAME READING FIRST SCHOOL (SES (% FREE/REDUCED LUNCH))  TITLE I SCHOOL TITLE I TARGETED ASSISTED SCHOOL CLASS GRADE SERVICES - ENGLISH AS A SECOND LANGUAGE SERVICES - TITLE I SERVICES - ONE-ON-ONE TUTORING SERVICES - NONE SERVICES - OTHER SERVICES - OTHER NAME ASSESSMENT FORM (A, B, OR C) ASSESSMENT DATE GROUP RHYME AWARENESS INDIVIDUAL RHYME AWARENESS GROUP BEGINNING SOUND AWARENESS INDIVIDUAL BEGINNING SOUND AWARENESS ALPHABET RECOGNITION - LOWERCASE LETTER SOUNDS SPELLING-TOTAL SCORE CONCEPT OF WORD: POINTING CONCEPT OF WORD: WORD ID CONCEPT OF WORD: WORD LIST CONCEPT OF WORD: TOTAL PREPRIMER WORD LIST PRIMER WORD LIST FIRST GRADE WORD LIST ENTRY LEVEL SUMMED SCORE IDENTIFIED BELOW BENCHMARK	VDOE - Division of Localized Programs Help and Information Network (DOLPHIN)	PROGRAM NAME ADDRESS_1 ADDRESS_2 CITY ZIP_CODE PHONE LICENSE_TYPE EXPIRATION_DATE ADMINISTRATOR BUSINESS_HOURS CAPACITY AGES  CRITICAL VIOLATIONS PREVIOUS YEAR  ECERS-R-INDOOR SPACE ECERS-R-FURN. FOR ROUTINE CARE ECERS-R-FURN. FOR RELAX ECERS-R-ROOM ARRANGEMENT ECERS-R-SPACE FOR PRIVACY ECERS-R-CHILD-RELATED DISPLAY ECERS-R-SPACE FOR GROSS MOTOR ECERS-R-GROSS MOTOR EQUIP. ECERS-R-GREETINGS/DEPARTING ECERS-R-MEALS/SNACKS ECERS-R-NAP/REST ECERS-R-TOILETING/DIAPERING ECERS-R-HEALTH PRACTICES ECERS-R-SAFETY PRACTICES ECERS-R-BOOKS AND PICTURES ECERS-R-ENCOURAGING CHILDREN TO TALK ECERS-R-USING LANG TO DEV RELATIONSHIP ECERS-R-INFORMATIONAL LANGUAGE ECERS-R-ART ECERS-R-MUSIC/MOVEMENT ECERS-R-CLOCKS ECERS-R-SAND/WATER ECERS-R-DRAMATIC PLAY ECERS-R-NATURE/SCIENCE ECERS-R-MATH/NUMBER ECERS-R-USE OF TV, VIDEO, COMPUTERS ECERS-R-PROMOTING ACCEPTANCE OF DIVERSITY ECERS-R-SUPERVISION OF GROSS MOTOR ECERS-R-GENERAL SUPERVISION ECERS-R-DISCIPLINE ECERS-R-STAFF-CHILD INTERACTION ECERS-R-INTERACTIONS AMONG CHILDREN ECERS-R-SCHEDULE ECERS-R-FREE PLAY ECERS-R-GROUP TIME ECERS-R-PROVISIONS FOR CHILDREN W/ DISABILITIES ECERS-R-PROVISIONS FOR PARENTS ECERS-R-PROVISIONS FOR PERSONAL NEEDS/STAFF ECERS-R-PROV FOR PROFESSIONAL NEEDS/STAFF ECERS-R-STAFF INTERACTION AND COOPERATION ECERS-R-SUPERVISION AND EVAL. OF STAFF ECERS-R-OPPORTUNITIES FOR PROFESSIONAL GROWTH  CLASS-POSITIVE CLIMATE CLASS-NEGATIVE CLIMATE CLASS-TEACHER SENSITIVITY CLASS-RESPECT FOR STUDENT PERSPECTIVES CLASS-BEHAVIOR MANAGEMENT CLASS-PROMOTIVITY CLASS-INSTRUCTIONAL LEARNING FORMATS CLASS-CONCEPT DEVELOPMENT CLASS-QUALITY OF FEEDBACK CLASS-LANGUAGE MODELING CLASS-  CHILD CARE PAYMENTS TOTAL CHILD CARE FIRST PAYMENT DATE CHILD CARE LAST PAYMENT DATE	VDOE - Virtual Child Information System (VCIS)	CLIENT BIRTHDATE LOCALITY_RIPS PROGRAM CATEGORY SUBSIDY TYPE SUBSIDY ELIGIBILITY TYPE CLIENT SEX CODE CLIENT RACE CODE PARENT INCOME PARENT INCOME SOURCE PARENT EMPLOYMENT TYPE PARENT OCCUPATION TYPE  SEX OF CHILD RACE OF CHILD DATE OF BIRTH PLURALITY HOSPITAL OF BIRTH PLACE OF BIRTH PLANNING DISTRICT PLACE OF BIRTH PLANNING DISTRICT OF MOTHER PLANNING DISTRICT OF RESIDENCE  ZIP CODE RACE OF MOTHER AGE OF MOTHER MOTHER'S PLACE OF BIRTH MOTHER'S EDUCATION RACE OF FATHER AGE OF FATHER FATHER'S PLACE OF BIRTH FATHER'S EDUCATION INFORMANT ATTENDANT DATE RECORD FILED LIVE BIRTHS, NOW LIVING LIVE BIRTHS, NOW DEAD BIRTH ORDER LEGITIMACY WEIGHT AT BIRTH DATE LAST LIVE BIRTH DATE LAST OTHER TERMINATION DATE LAST NORMAL MENSES APGAR 1 MINUTE APGAR 5 MINUTES PHYSICIAN'S ESTIMATE OF GESTATION MONTH OF PREGNANCY PRENATAL CARE BEGAN NUMBER OF PRENATAL VISITS HISPANIC ORIGIN OF MOTHER HISPANIC ORIGIN OF FATHER MOTHER TRANSFERRED PRIOR TO DELIVERY INFANT TRANSFERRED MEDICAL HISTORY FOR THIS PREGNANCY TOBACCO USE DURING PREGNANCY AVERAGE NUMBER OF CIGARETTES PER DAY ALCOHOL USE DURING PREGNANCY AVERAGE NUMBER OF DRINKS PER WEEK WEIGHT GAINED DURING PREGNANCY (LBS) OBSTETRIC PROCEDURES EVENTS OF LABOR AND/OR DELIVERY METHOD OF DELIVERY CONDITIONS OF THE NEWBORN CONGENITAL ANOMALIES OF CHILD SOURCE OF PRENATAL CARE METHOD OF PAYMENT HEROIN USED METHADONE USED MARIJUANA USED COCAINE USED AMPHETAMINES USED OTHER DRUGS USED
VDOE - Phonological Awareness Literacy Screening (PALS)	VDOE - Quality Record System (QRS)	VDOE - Payment System (PS)	VDOE - Vital Record Birth	SAMPLE / NOT ACTUAL	

# How Does De-Identification Work in the HANDS System?



# Getting Data Ready for “De-Identified Federation”

## What the Data Adapter Does



## Cleaned and Encoded Matching Data (Internal ID, First and Last Name)

**INTERNAL\_ID** is the same  
**LAST\_NAME** is NOT

Many agencies DO NOT have an Index of unique individuals. There can be many representations of that individual.

# What do we do?

# Statistical Log Analysis and Reduction

*We dynamically build a new  
“virtual” record made up of  
“most likely” demographics*

# Probabilistic Linkage Process (Creating a Linking Directory)

(After we have a unique person index for each agency dataset)

Blocking

m and u Parameter Calculation

Matching-Column Weight Calculations

Match Scoring

Linkage Determination and addition to Linking Directory

- Linkage Determination – A Cutoff score needs to be set for each blocked comparison, below which a link is not accepted as a real “link”
- The best method of establishing this cutoff is for the system operator to work with a content-area expert to determine the peculiarities of data for that content-area
- In some data sets it may be very unlikely that a birthdate was entered incorrectly, while in another, it may happen very regularly – a computer can not automatically know this
- Once these cutoffs are set, they don’t need to be changed unless something drastic occurs to change the nature of the dataset

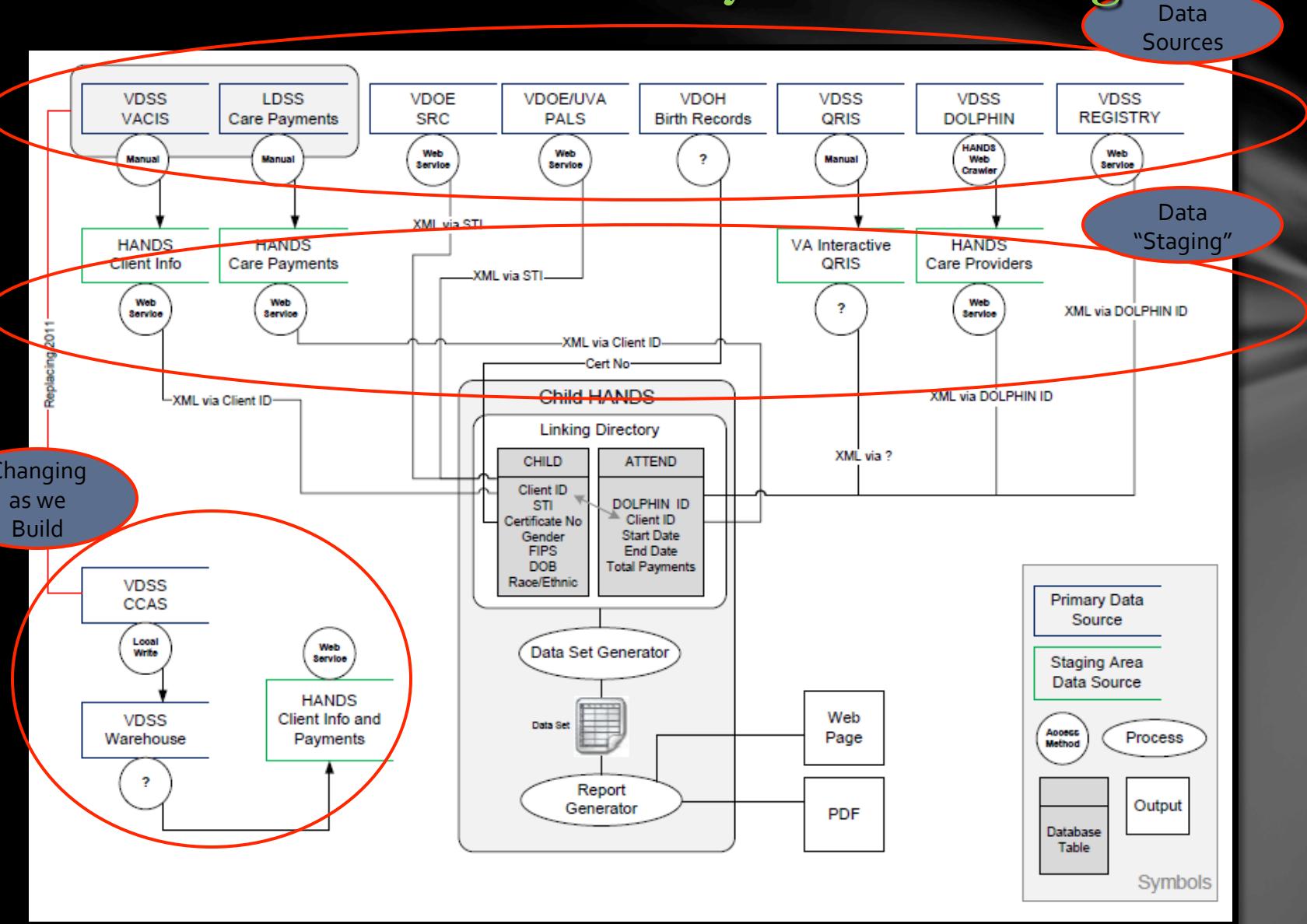
# What do we get after creating the Linking Directory? HANDS Linking in Action!

Data being linked and pulled from multiple agency Data Adapters.

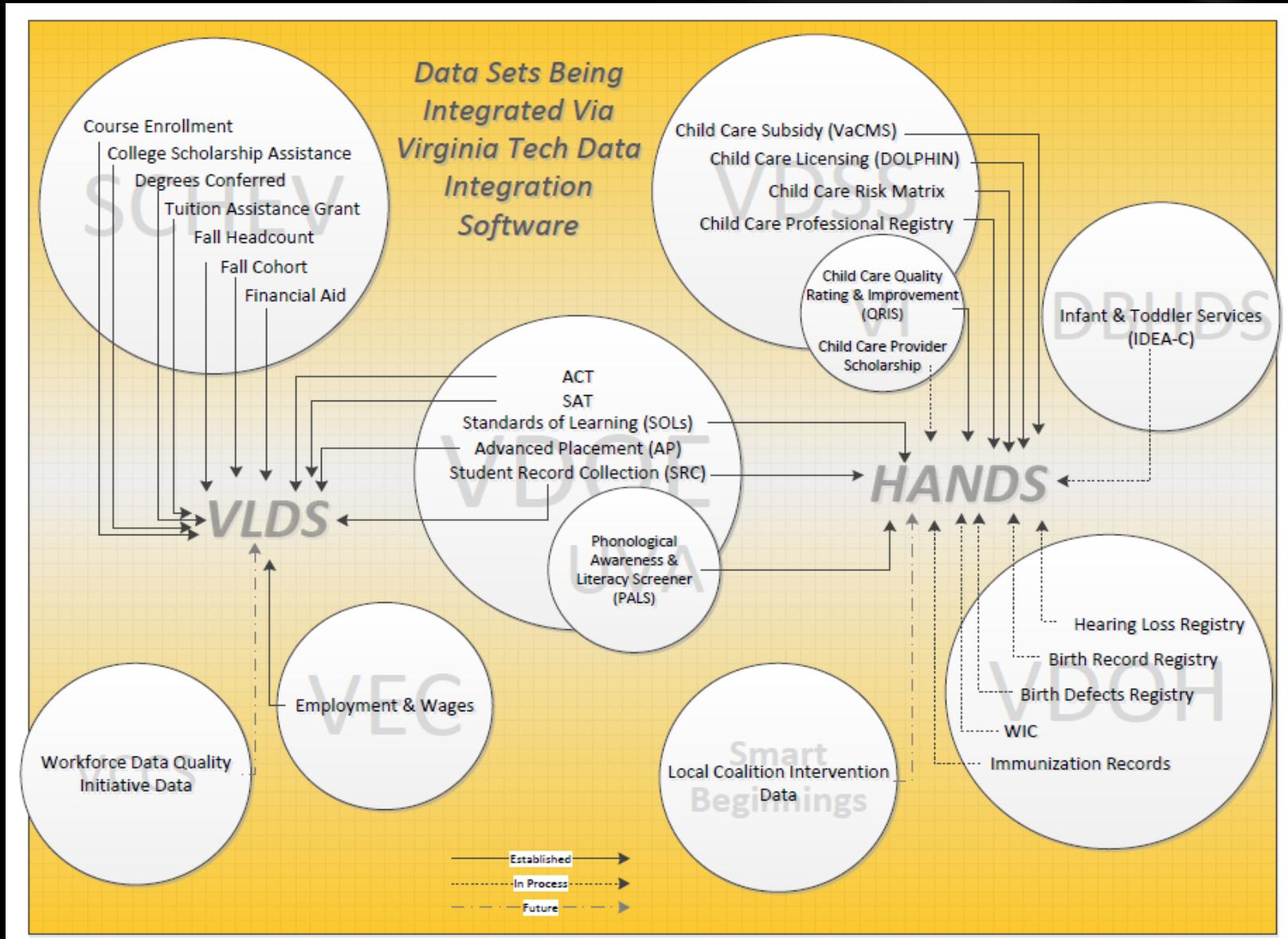
This used to take MUCH LONGER.

The screenshot shows a software interface for managing data links. At the top, a header bar displays "Welcome aaron.schroeder@vt.edu! [ Log Out ]". On the left, a sidebar lists database connections: "HANDS", "HANDS\_LINK", and "Tables". Under "Tables", two tables are listed: "CHILD\_IDS\_DEMOGRAPHIC" and "CHILD\_IDS\_DMGS". The main workspace is a query builder grid with columns: Output, Expression, Aggregate, Alias, Sort Type, Sort Order, Grouping, Criteria, Or..., and Or... (with the last two being ellipses). Below the grid are three buttons: Refresh, Reconnect, and Execute query. A large black rectangular redaction box covers the bottom right corner of the screen.

# Child HANDS: Initial Data Systems for Integration



# Child HANDS and the Virginia Longitudinal Data System



# Project Child HANDS in Action

## Initial Research Study

### Initial Questions To Drive Development

1. What type of care are parents choosing with subsidy dollars?
2. What is the quality of the child care?
3. How are their children doing in Kindergarten?

# Project Child HANDS

## Initial Research Questions Data Sources

What type of care are parents choosing with subsidy dollars?

- Data: Subsidy records (VDSS, local)
  - VA Client Information System
  - Payments to child care providers

What is the quality of the child care?

- Data: Quality indicators (VDSS, VECF)
  - Licensing status, violations (DOLPHIN)
  - Program quality overall (VSQI)

# Project Child HANDS

## Initial Research Questions Data Sources

How are their children doing in Kindergarten?

- Data from Student Record Collection (VDOE) and University of Virginia PALS Office
  - Attendance (SRC)
  - Retention (SRC)
  - Special services/IEP placement (SRC)
  - Phonological Literacy Awareness Screening (PALS; UVA)

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## Initial Research Study

### Research Study: Five Localities (Wave I)

Time period: 2006 – 2010

#### Sample

- From *five* localities, subsidy children = 6009
- Youngest were infants (n = 1230); Oldest 16 by end of study period (n = 26)
- 1862 with birth date between '9/30/2001' and '9/30/2004'

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## Initial Research Study

### Subsidy to Licensing Match

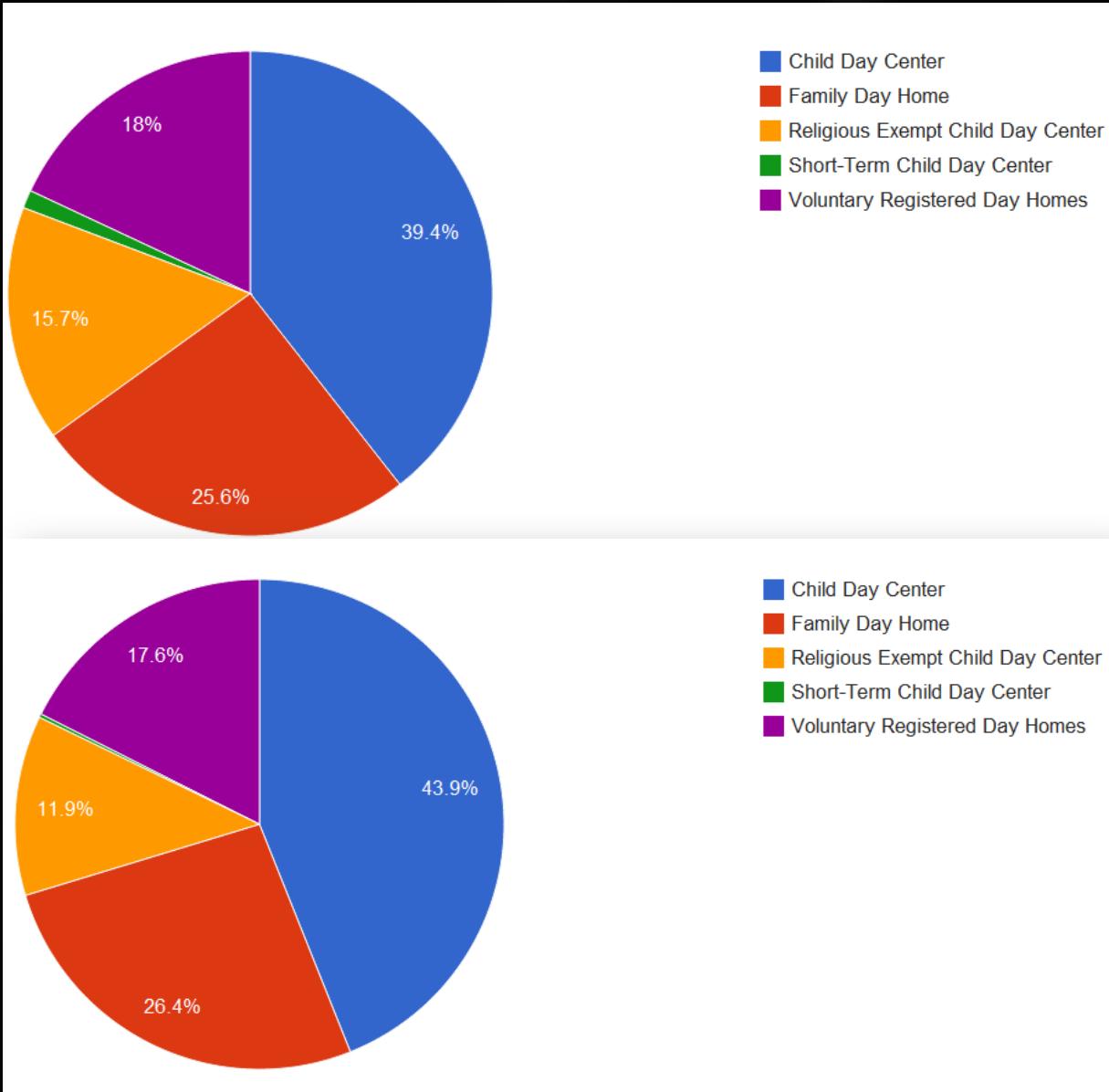
- 888 vendors received subsidy payments during study time period
- 452 matched to licensing data (51% )

*This match accounts for 72 % of the total Wave I children receiving subsidy during that time*

# VA Licensed Programs

REPRESENTATIVE  
SAMPLE

## Wave I Programs



# Project Child HANDS

## Initial Research Study

**Research Q 1: What type of care were parents choosing for their children with subsidy dollars?**

- Substantially more parents (72.5%) enrolled their children in licensed child care compared to FFN (27.5%)
- Equally child care centers (44 %) and family child care homes (44%), with 11% in religiously-exempt placements.

# Project Child HANDS

## Initial Research Study

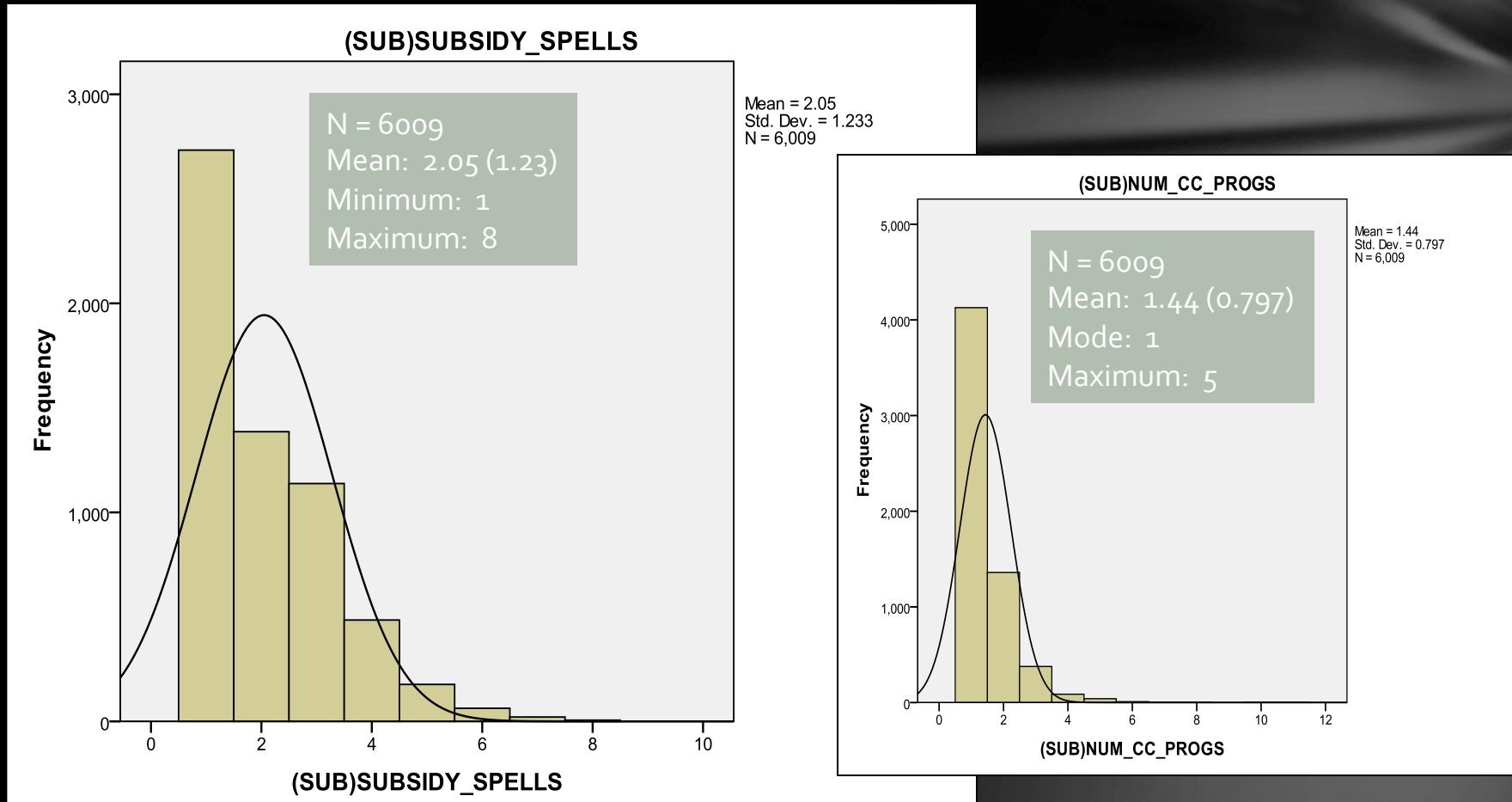
### Subsidy Use Patterns

- The more subsidy spells, the more likely a child enrolled in multiple programs.
- Children with more subsidy spells were slightly more likely to have longer spells.
- The most common pattern: a single spell of about 9 months in the same program

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## Initial Research Study

### Subsidy Use Patterns, 2007 - 2010



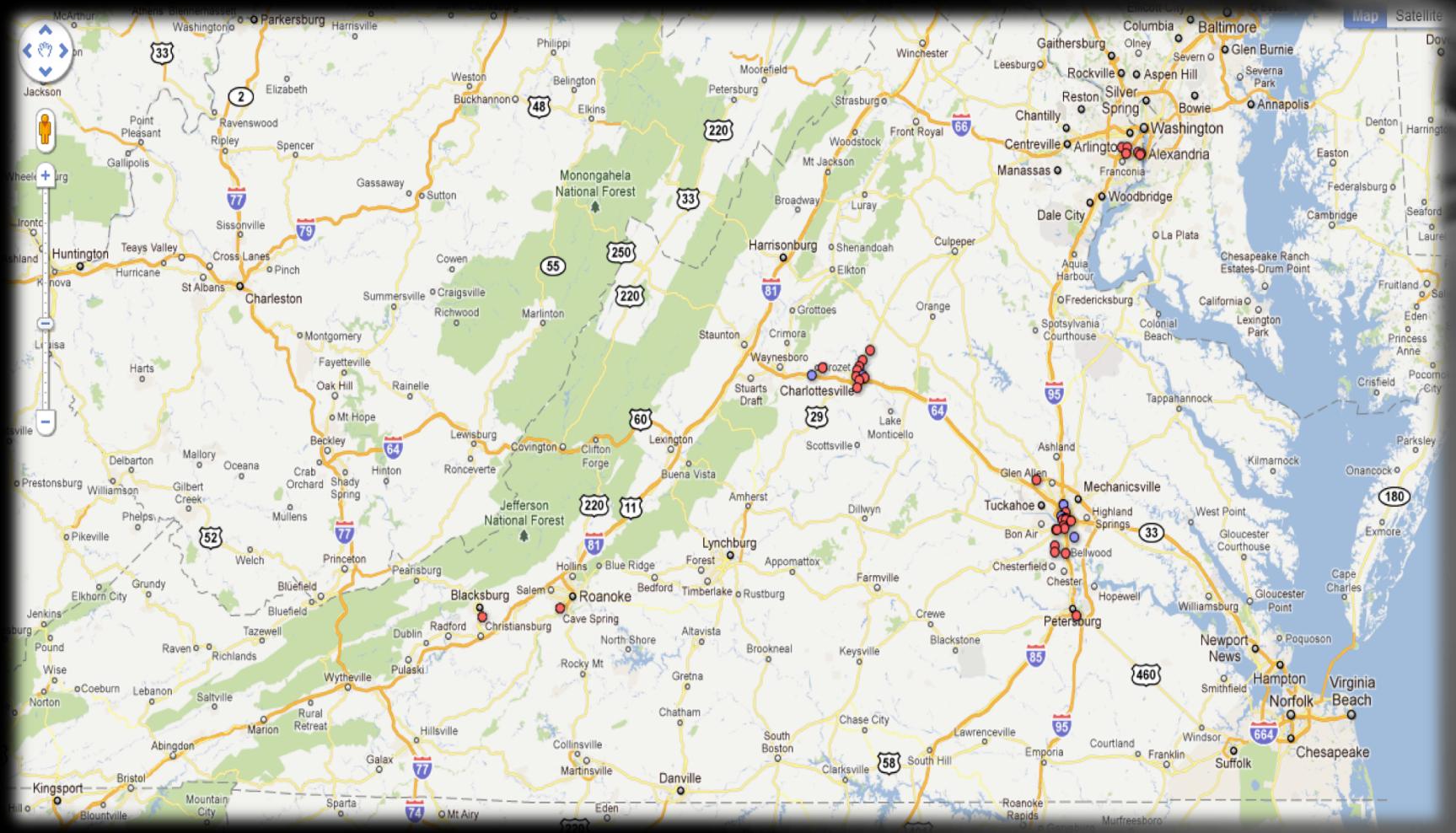
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## Initial Research Study

**Q2: What is the quality of care?**

Quality Type	Quality Indicator	Data Source
Licensed or not	VA Child care license	VDSS DOLPHIN
License violations	Number and type of licensing violations	VDSS Risk Assessment Matrix
Center Environment	Classroom Observations	VSQI (VDSS and Virginia Interactive)
Staff Qualifications	Transcripts, professional Development records	Early Childhood Professional Registry (in development)

# HANDS Wave 1 VSQI (2007-2010)



# Project Child HANDS

## Initial Research Study

### Subsidy to Kindergarten Match

- 8/1/2006 - 7/31/2010
- Kindergarten in academic years 2006-07, 2007-08, 2008-09, and 2009-10
- 1862 with birth date between '9/30/2001' and '9/30/2004'
- 1703 successfully matched to school records (91 %)

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## Initial Research Study

### Research Q3: How did children who used subsidy fare in Kindergarten?

- Children who had longer continuous spells of subsidized care attended more days of public elementary school
- Children who had longer care spells scored higher on fall Kindergarten PALS screener
- Accounting for greater attendance, this group of children was more likely to meet fall Kindergarten PALS benchmarks.

# Project Child HANDS

## Initial Research Study

### Preliminary Conclusions

- Project Child HANDS matching algorithms are capturing a very high percentage of eligible matches; supports use of the system.
- Preliminary results examining child care subsidy patterns indicate longer continuous spells of care predicts better school readiness in domains we can measure.
- If findings are replicated and robust, policy implications may be to allow longer care spells, more independent of parental employment.

# Project Child HANDS

## Initial Research Study

### Examples of Other Policy or Evaluation Questions

1. What are the social service trajectories and school outcomes of children born with special health care needs? (Hearing loss, birth defects)
2. What impact does early intervention have on school outcomes?
3. What interventions or programs are most helpful to children and families involved in child protective services?

# **Bringing Service and Research Dollars into Virginia**

With proper infrastructure support, Project Child HANDS, together with the SLDS, has the potential to bring active foundation and other funding into the Commonwealth.

Example: Project LAUNCH (SAMHSA RFP SM-12-009)  
**Cooperative Agreements for Linking Actions for Unmet  
Needs in Children's Health**  
(Up to \$850,000 per year, 5 years, no match)

Example: **Managing and Learning from Activities in  
Payment and Delivery System Reform**  
(Robert Wood Johnson Foundation)