

# Cornerstones

Hope for Tomorrow Today



## Final Presentation

### SYST-699

### Fall 2014

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# Agenda

- About Cornerstones
- Problem Definition
- Project Planning and Management
- Analysis
- Requirements
- Design
- Tools
- Integration, Test, and Validation
- Handoff
- Conclusion & Future Work
- Questions

# Cornerstones

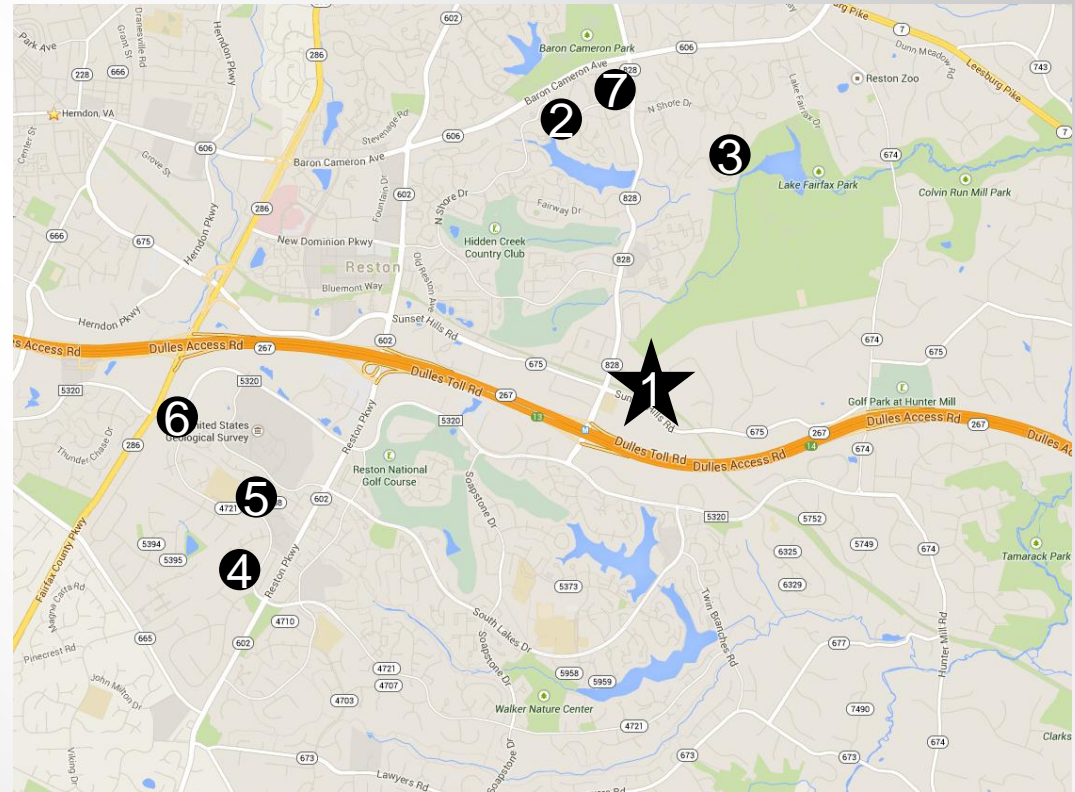
- Cornerstones promotes self-sufficiency through providing support and advocacy to those in need of food, shelter, affordable housing, quality childcare, and other human services
- Cornerstones operates their programs and provides their services from many locations

# Neighborhood Resources

- Assistance Services and Pantry Program (ASAPP)
  - 1 center in Reston: “The Food Pantry”
- Community Based Initiative (CBI)
  - 5 centers: Cedar Ridge CC, Stonegate Village CC, Southgate CC, West Glade Club House, Crescent CC

# Locations

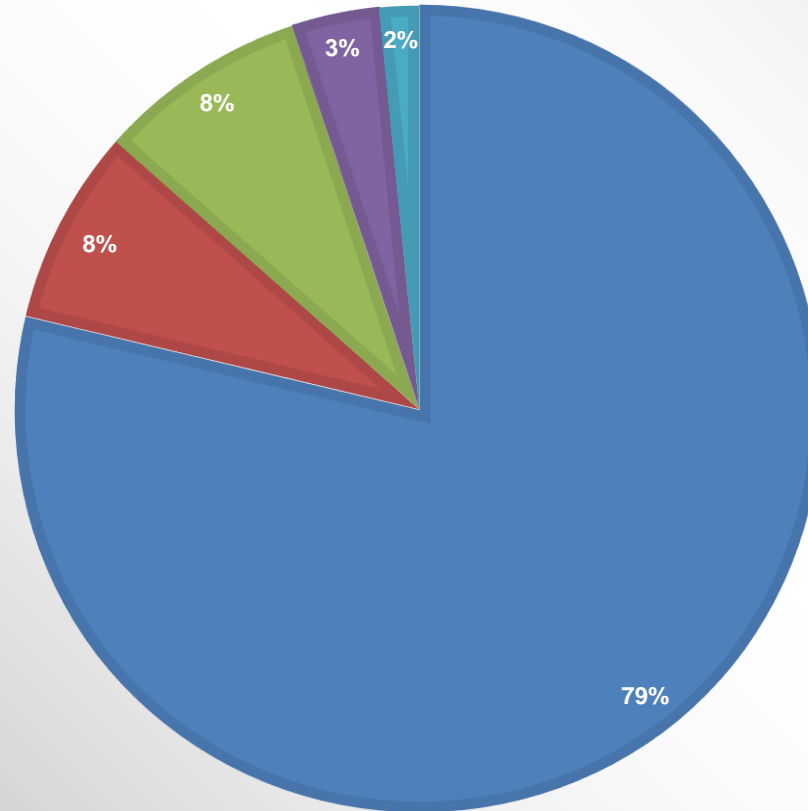
1. Cornerstones HQ
2. The Food Pantry
3. Cedar Ridge
4. Stonegate
5. Southgate
6. West Glade
7. Crescent



# Statistics FY14

## DISTRIBUTION OF CORNERSTONES CLIENTS

- Neighborhood Resources - 11,518
- Emergency & Supported Housing Programs - 1,146
- Community Building & Connections for Hope - 1,228
- Family Stability and Child & Health Development - 516
- Affordable Housing Development, Preservation & Asset Management - 226



# Problem Definition

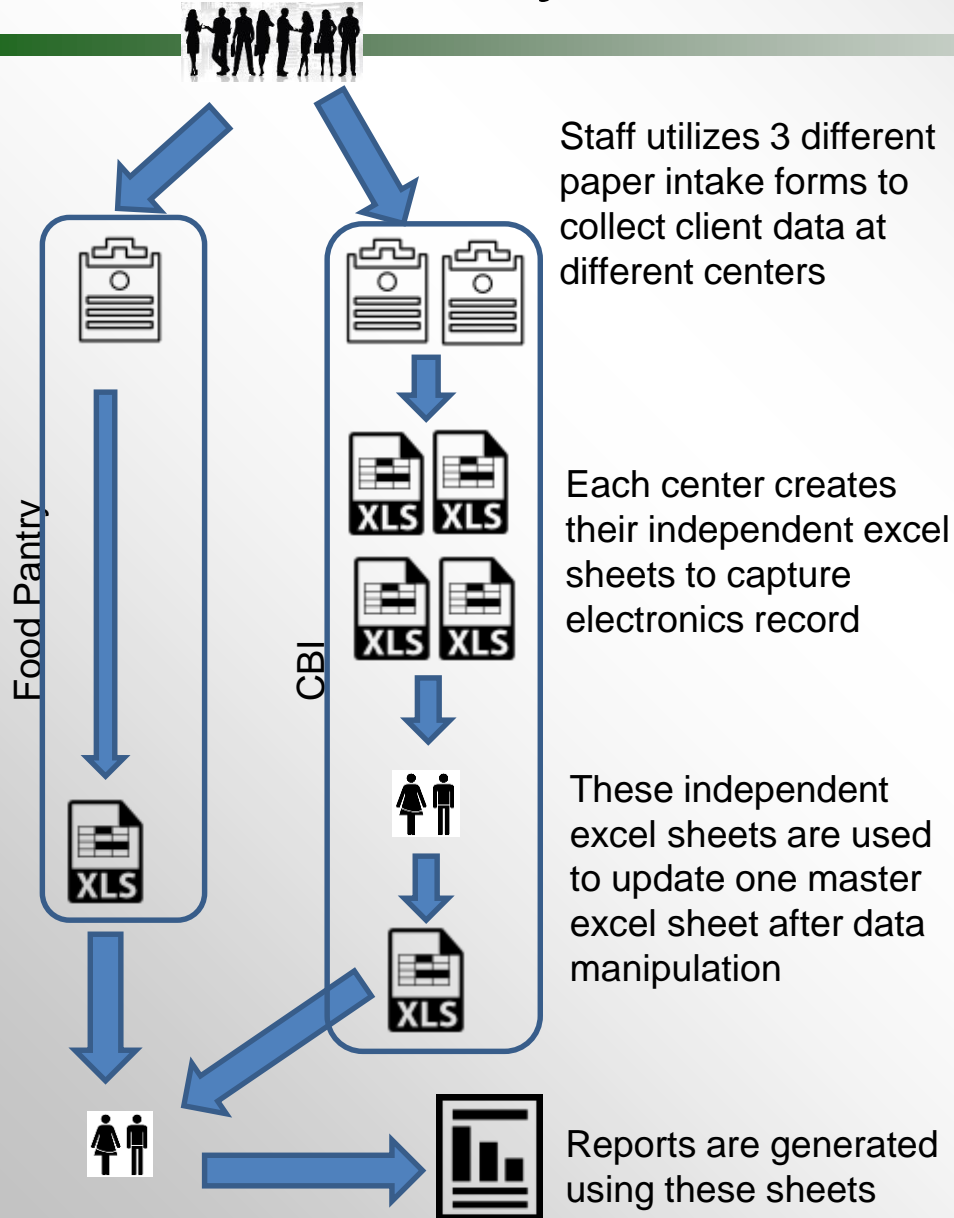


# Problem

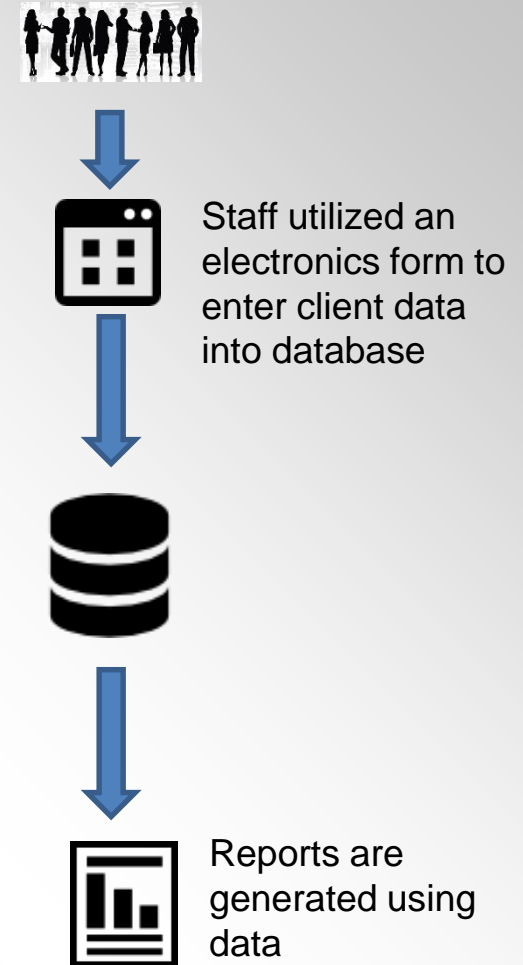
- Data collected at different locations is inconsistent and disjoint
- Labor intensive process to manage data, to track client, and to generate reports
- Incomplete information to generate accurate reports to secure funding from sponsors



# Current System



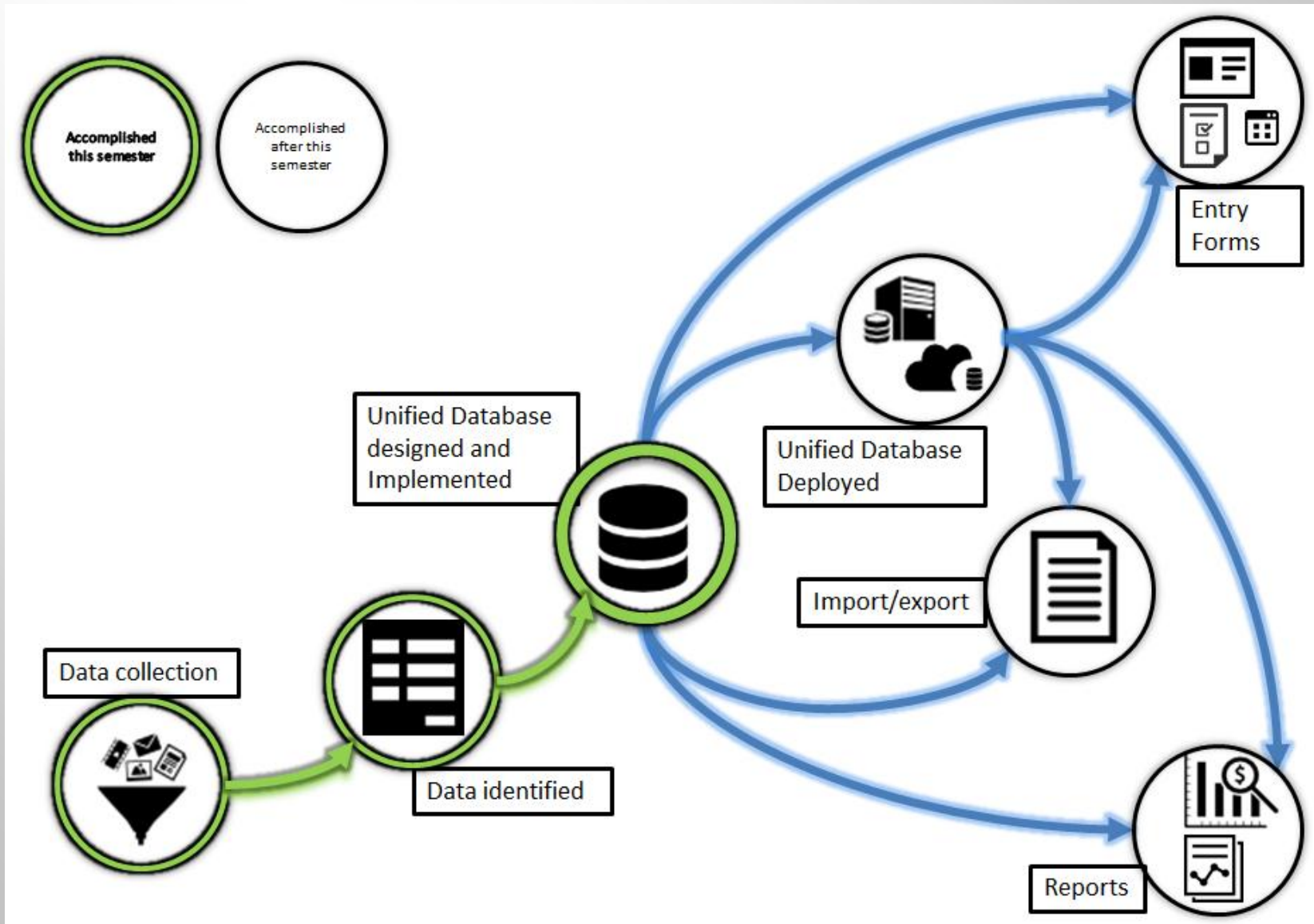
# Envisioned System



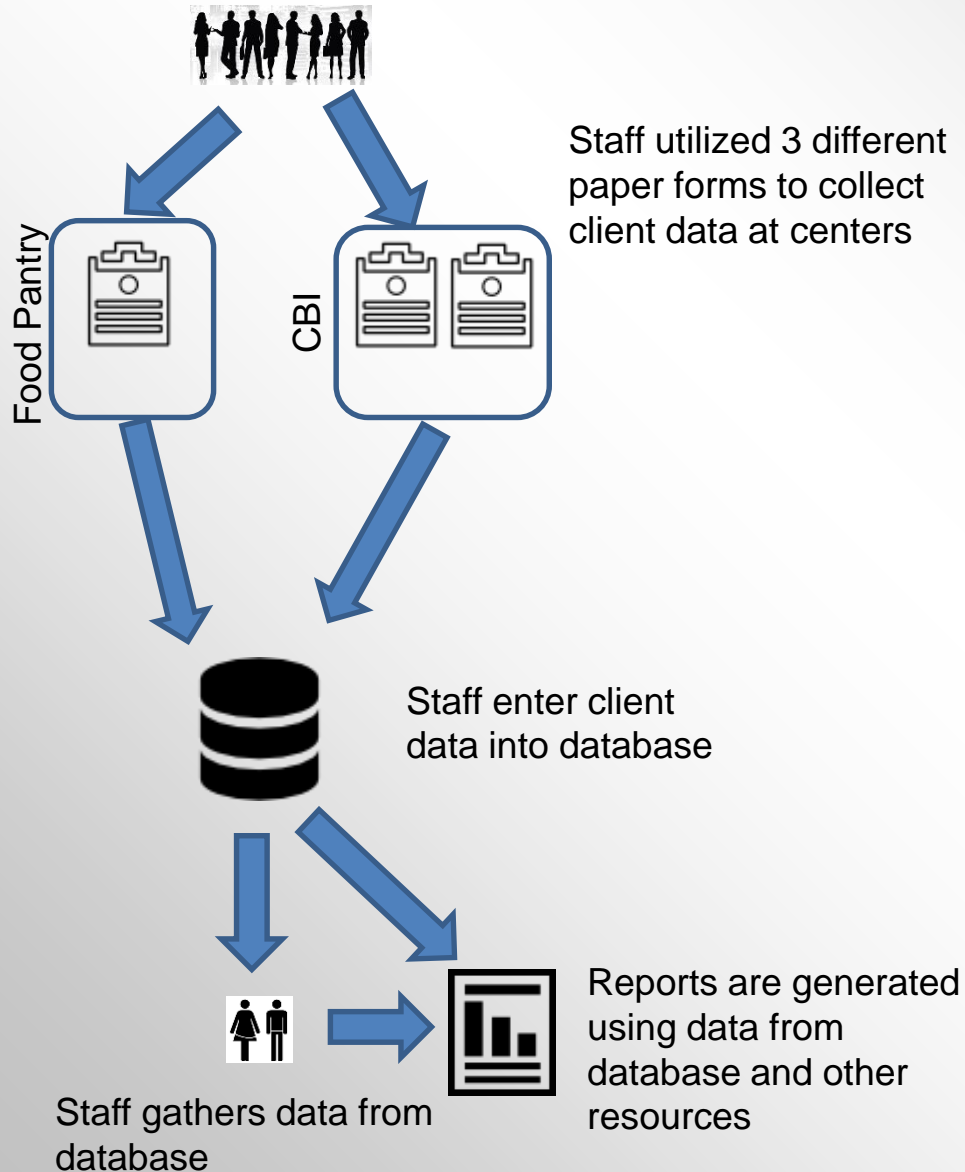
# Problem Statement

Distributed, inconsistent, and insufficient data across all programs make it practically impossible for statistical based determination of critical performance measures

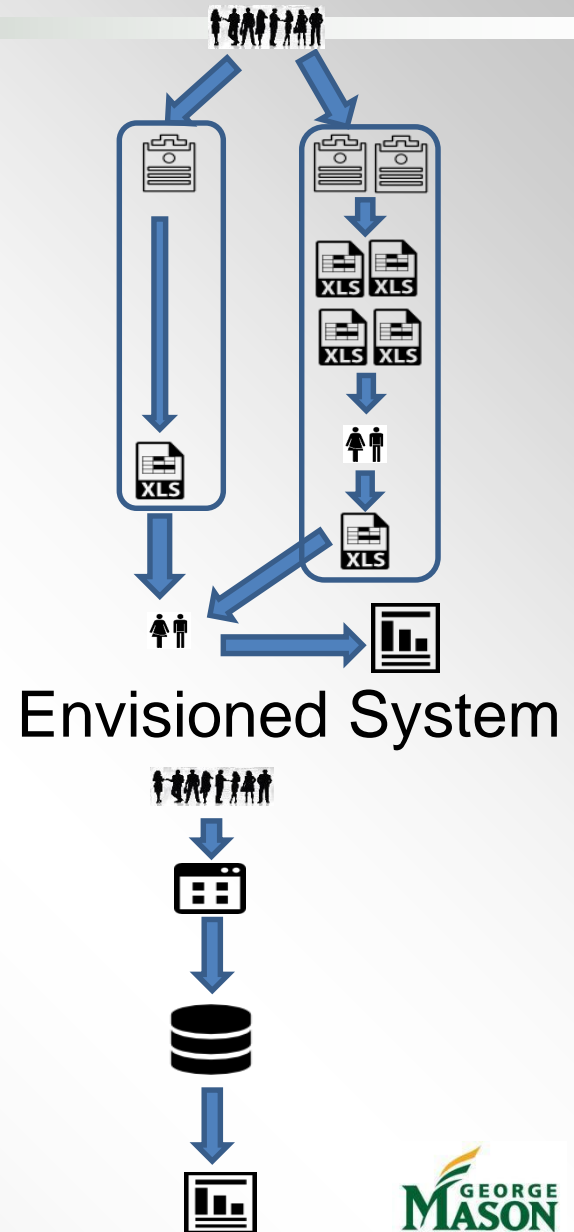
# Capability Roadmap



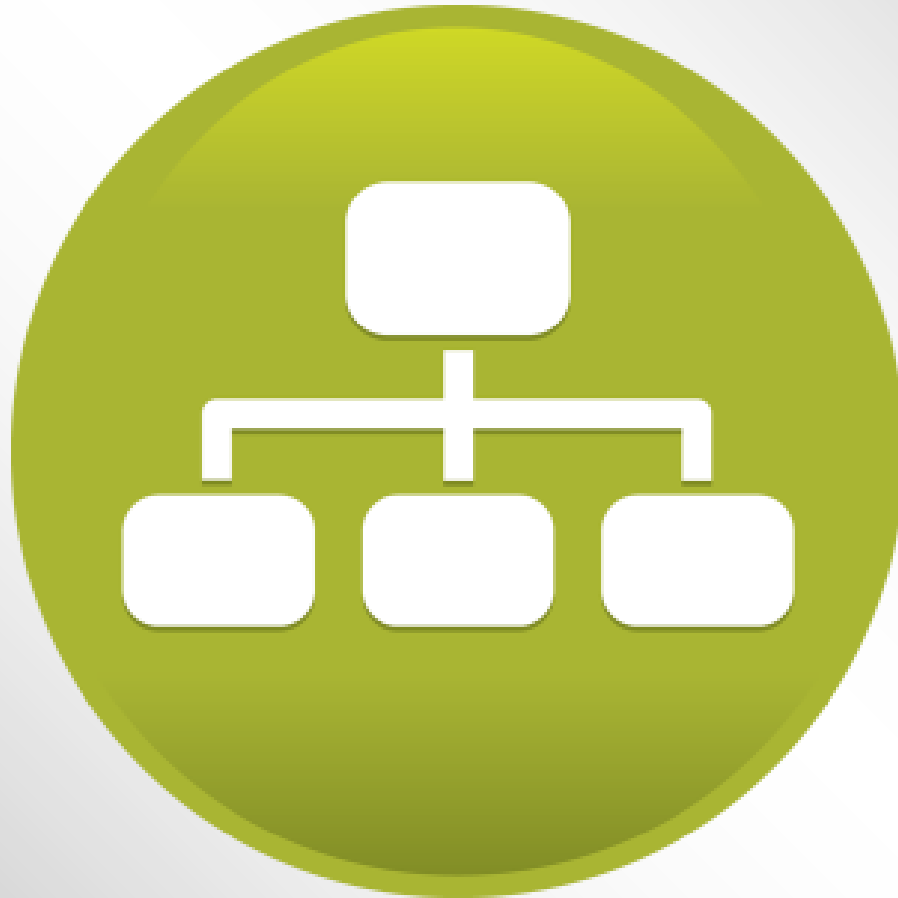
# Delivered State



# Current System



# Project Planning and Management



# Project Planning

- Conducted several meeting to develop the problem statement and scope
- Communication Approach
  - Status meetings every other Wednesday with Cornerstones
  - Status meeting every Sunday with the team
  - Action items documented, assigned to individual, and progress tracked at follow up meetings
- On-site working group meetings to learn about their operates
- Conducted several technical interchange meetings to collect feedback and review requirements, design, and implementation

# Project Management

- Integrated Master Schedule (IMS) & Work Breakdown Structure (WBS) managed in Microsoft Project
  - GMU Team regularly measured work completed against schedule and kept track of all deliverables and milestones
- Risk Management
  - Project risks were identified in the Project Plan and a risk mitigation strategy was implemented for all tracked risks
- Roles & Responsibilities
  - GMU Team members were assigned project roles and responsibilities as tracked in the IMS.

# Major Scheduled Activities

- Develop Project Plan
- Collect Data
- Capture Originating Requirements
- Develop Requirements
- Identify Data
- Identify Reports
- Develop Unified Database Design
- Develop Test Database
- Integrate, Test, and Validate
- Customer Handoff



# Analysis





# Intake Forms

- Food Pantry and Wellness forms are very similar
  - Food Pantry has 6 additional questions
  - Wellness has 2 additional questions
- CBI form is a very simple one page form

# Intake Forms Analysis

	Form 1	Form 2	Form 3	New
First Name	x	x	x	
Last Name	x	x	x	
DOB				x
City of Birth				x
Gender				x
Co-Applicant Name	x	x	x	
Address	x	x	x	
Referred by	x	x	x	
Email	x	x	x	
Employment Status	x		x	
Reason if not employed	x		x	
Financial Assistance from Gov Programs			x	
Help with budgeting \$	x			
Desire info on budgeting	x			
SNAP	x			
WIC	x			
Current participant in Cornerstones programs	x		x	

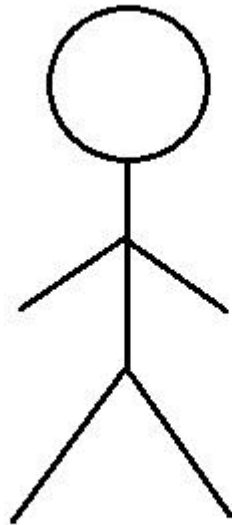
	Form 1	Form 2	Form 3	New
Race	x	x	x	
Ethnicity	x	x	x	
Country of Origin	x		x	
Primary Language	x		x	
Household Members	x	x	x	
Disabled	x		x	
Single Female Head	x	x	x	
Male Head	x	x	x	
Members <18	x	x	x	
Disabled Members <55	x	x	x	
Members >55	x	x	x	
Member Unemployed 18-55	x	x	x	
TANF Received		x		
Monthly Income Source	x		x	
Total Income			x	
Annual Income		x		
Health Insurance	x			
Children w/ Health Insurance	x			
Misc	x			

Legends	
Form 1	Food Pantry (ASAPP)
Form 2	Community Based Initiative (CBI)
Form 3	Wellness
X	Exists on form

# Report Analysis

- # of individuals client by race
- # of households client by race
- # of individuals client by ethnicity
- # of households client by ethnicity
- # of households with any children (under 18)
- # of households with a senior (over 55)
- # of households with an unemployed member
- # of times a service is received/delivered over a given time frame
- # of households by income category
- # of households headed by gender type

# Use Cases



# Use Cases Overview

- Use Case 1: New Applicant Filling Out Form
- Use Case 2: Staff Providing Food Pantry Service to Existing Applicant
- Use Case 3: Client Attends Service
- Use Case 4: Staff Generates Reports for Program
- Use Case 5: Create New Entry From Household
  - Use Case 5a: Single Client Becomes Part of a Household
  - Use Case 5b: Client Moves from Member of a Household to His/Her Own Household as a Head
- Use Case 6: Add New Client to Database
- Use Case 7: Update Existing Client Record in Database

# Add New Client to Database

<u>Step</u>	<u>Actor</u>	<u>Action Description</u>
1	Staff	Accesses database
2	Database	Prompts Staff for user identification and password
3	Staff	Staff provides authentication credentials
4	Database	Accepts credentials and allows access to client records
5	Staff	Selects new client record entry and enters in the information collected from the application; saves the input
6	Database	Stores the new client record



# Requirements



# Requirements Outline

- Functional Requirements

- Data management
  - Data fields
  - Tables
  - Queries
- Import/Export
- Reporting
- Configuration

- Interface Requirements

- User Interface
  - Front-end
  - Back-end
- Hardware

- Non-Functional Requirements

- Performance
  - Capacity
  - Availability
- Operational Environment
- Security
  - Protection
  - Authorization and Authentication

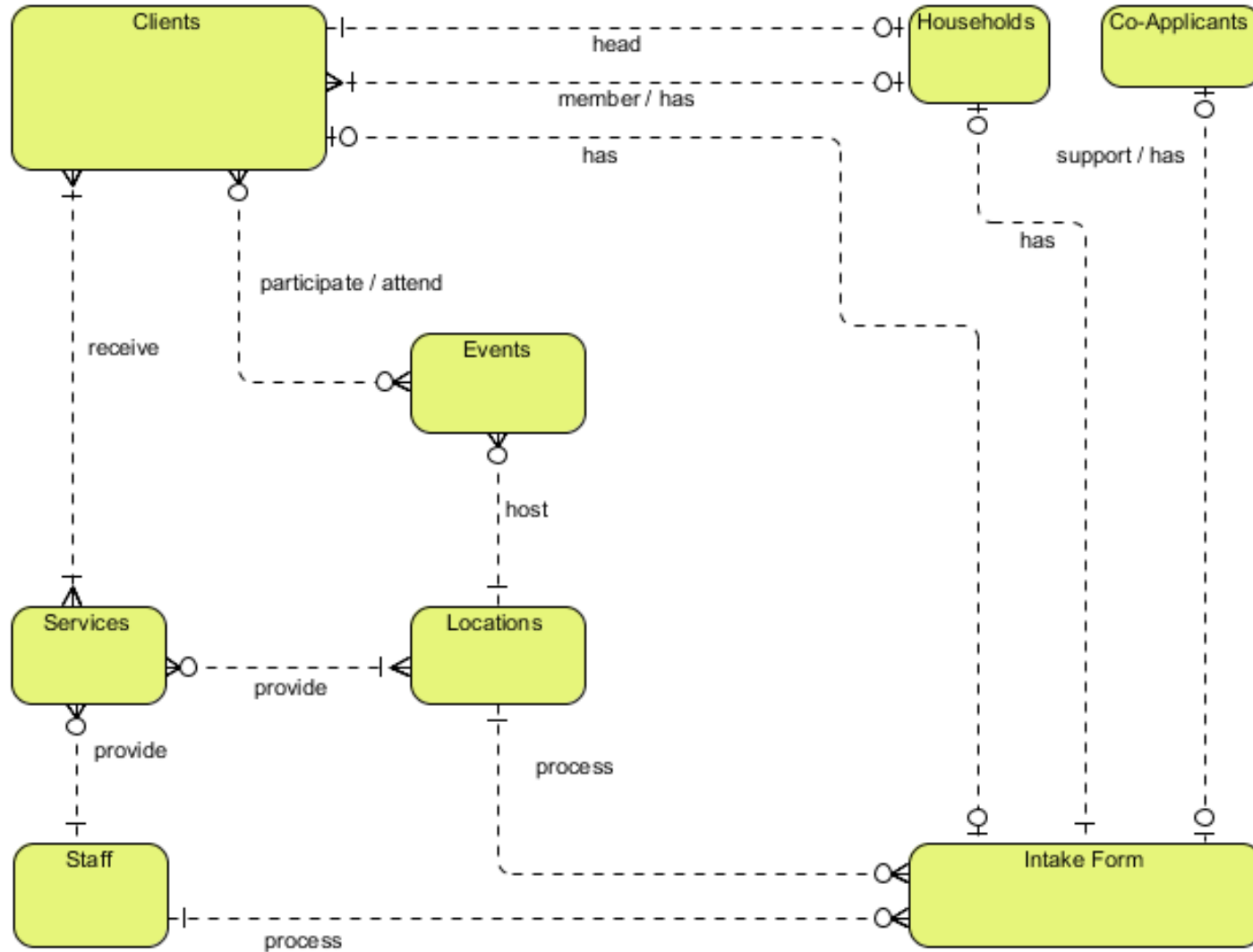
# Requirements Traceability

ID	Requirement	Use Case	Conceptual Design Entity	Logical Design Element	Physical Design Element
CUD-001	The database shall store the "First Name" of the client.	6	Clients	Clients: Full Name	clients: first_name
CUD-014	The database shall store the client's history of visits to Cornerstones program sites.	3	Events	Events: Description; Events: Date	events: description; events: start_date; events:end_date

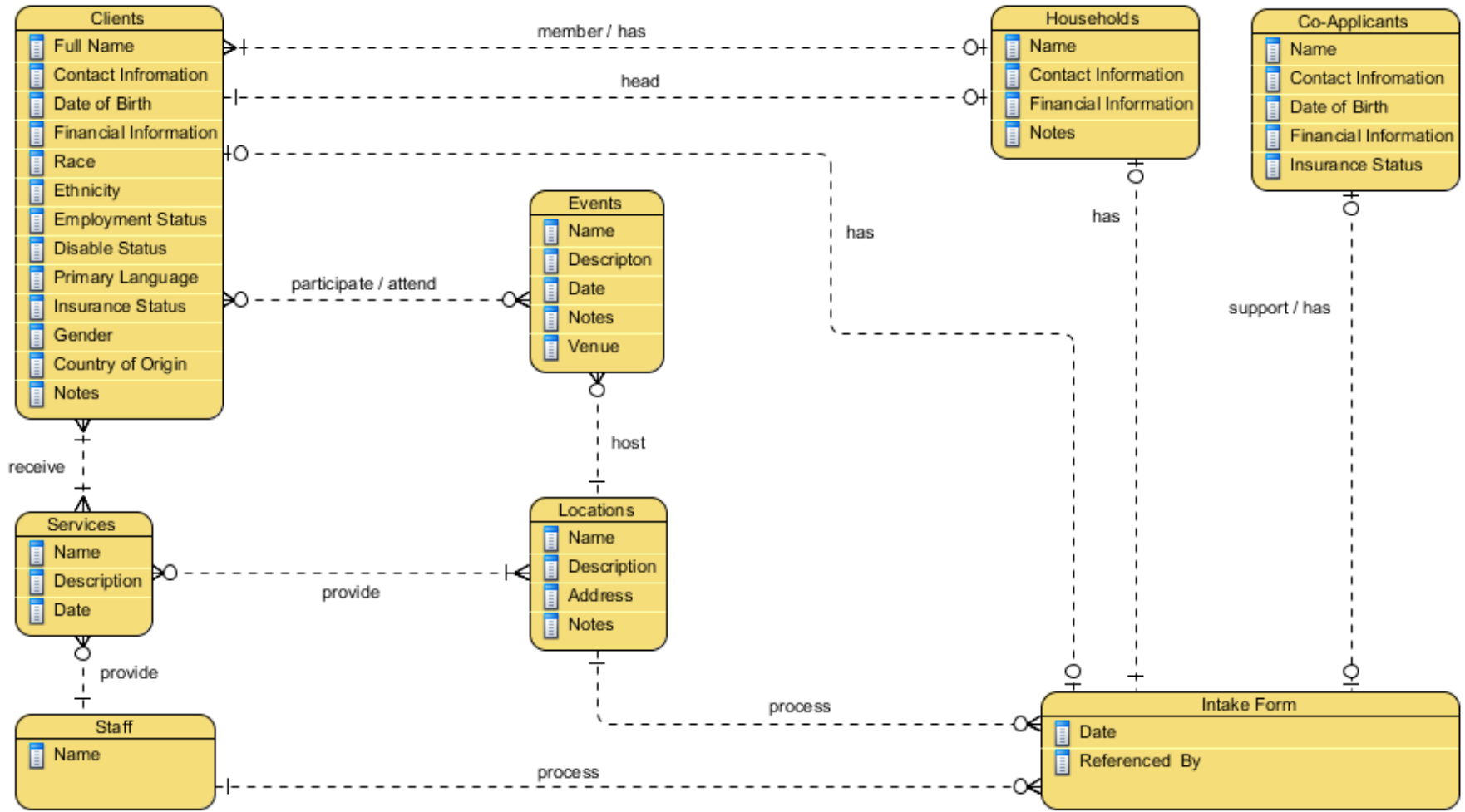
# Design



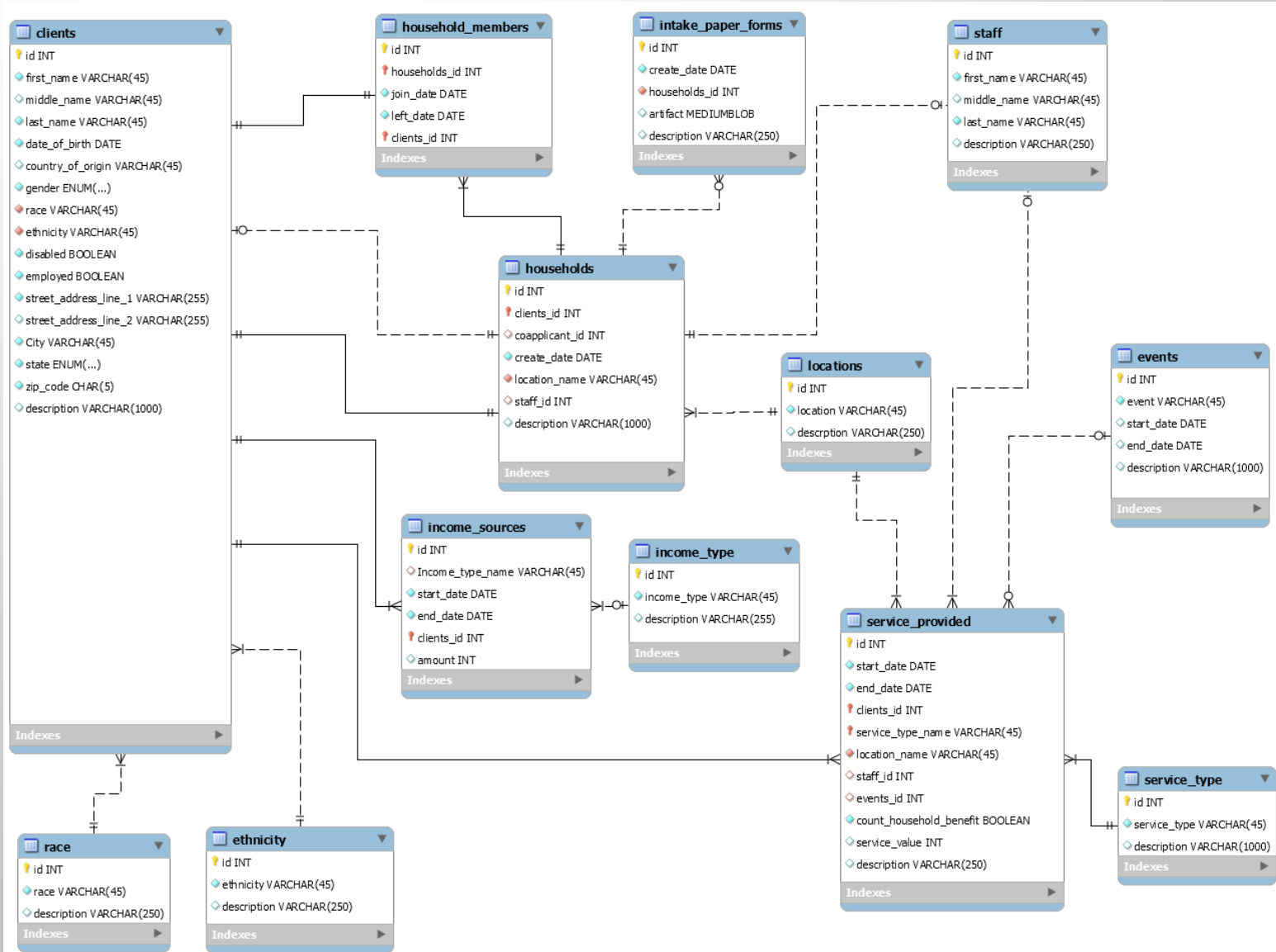
# Conceptual Design



# Logical Design



# Physical Design



# Database Schema Features

- Database allows one to add the following without schema change
  - Race
  - Ethnicity
  - Income Type
  - Service Type
  - Events
  - Location/Centers
  - Variable number of household members
- Database allows one to save a scanned copy of the intake paper form



# Benefits of Unified Database

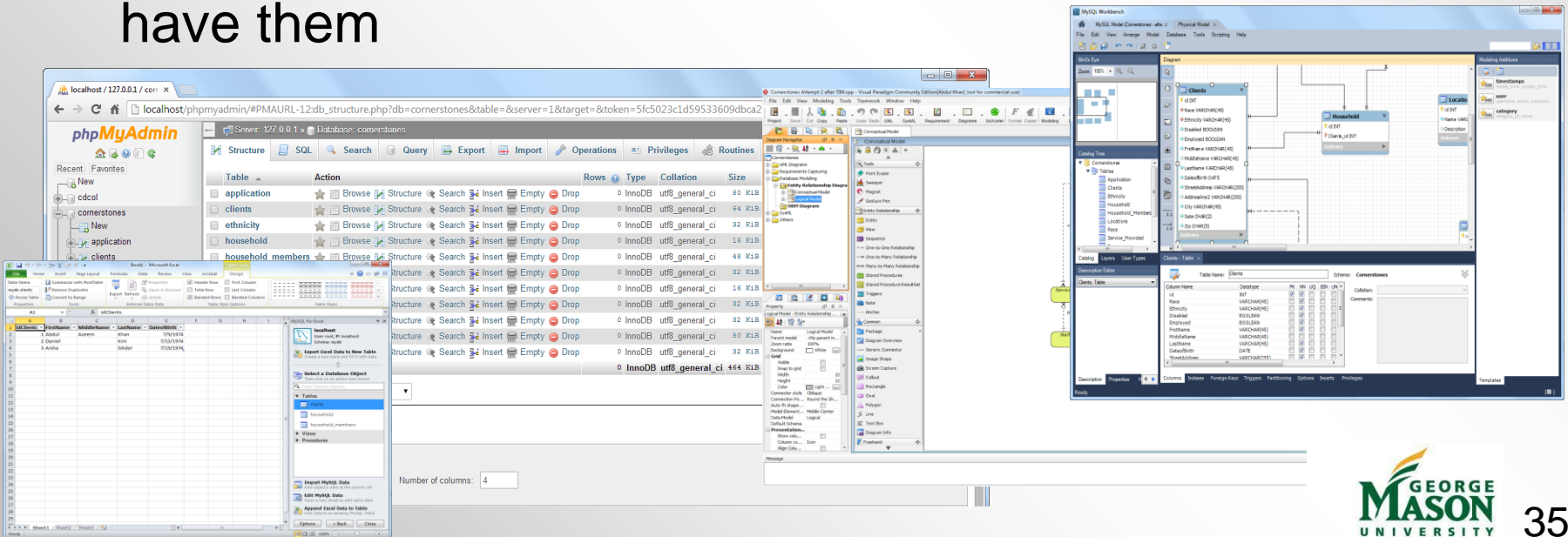
- Correlate increase in services because of increased births
- Changes in household size and average over time
- Increase and decrease in household count over time
- Income trends over time for household or member served
- Correlate services received by certain demographics
- Correlate services received by income ranges
- Trends in services, referral, and other aspects
- Track household or member progress overtime due to services received
- Track same service received within a period of a household/member
- What services are causing impacts (effectiveness of the services)
- Keeps track of service history by location for each client

# Tools

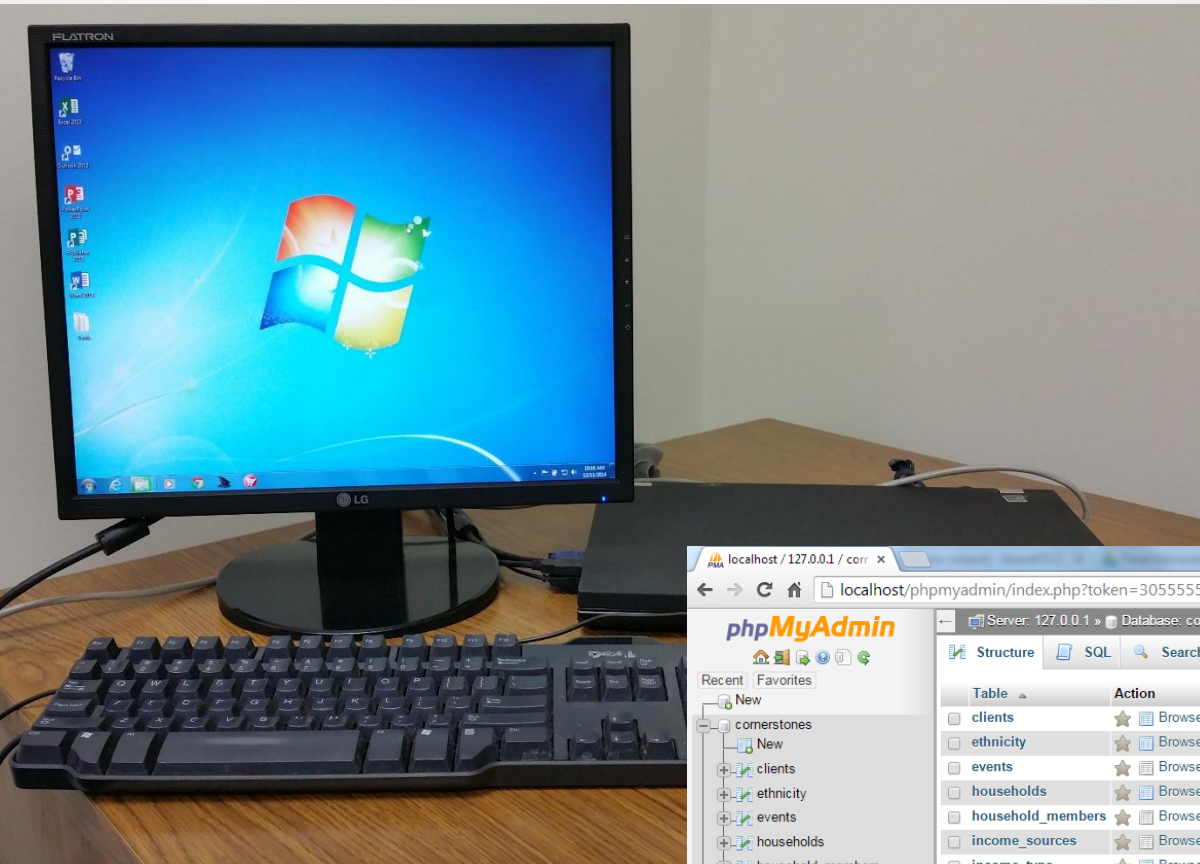


# Tools

- Visual Paradigm – utilized for design
- MySQL Workbench – utilized for design
- XAMPP – utilized for webserver
- phpMyAdmin – utilized for web interface
- All tools utilized are available at no cost (Community version and others license) or Cornerstones already have them



# Integration, Test, and Validation



localhost / 127.0.0.1 / cor... x

localhost/phpmyadmin/index.php?token=305555800deec1662bae9beb8446#PMAURL-1-db\_structure.php?db=cornerstones&table=&server=1&t...

Server: 127.0.0.1 » Database: cornerstones

Structure SQL Search Query Export Import Operations Privileges Routines Events

Table	Action	Rows	Type	Collation	Size	Overhead
clients	★ Browse Structure Search Insert Empty Drop	4	InnoDB	utf8_general_ci	64 K B	-
ethnicity	★ Browse Structure Search Insert Empty Drop	2	InnoDB	utf8_general_ci	32 K B	-
events	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16 K B	-
households	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8_general_ci	96 K B	-
household_members	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	48 K B	-
income_sources	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	48 K B	-
income_type	★ Browse Structure Search Insert Empty Drop	8	InnoDB	utf8_general_ci	32 K B	-
intake_paper_forms	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	32 K B	-
locations	★ Browse Structure Search Insert Empty Drop	5	InnoDB	utf8_general_ci	32 K B	-
marital_status	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8_general_ci	32 K B	-
race	★ Browse Structure Search Insert Empty Drop	8	InnoDB	utf8_general_ci	32 K B	-
service_provided	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	96 K B	-
service_type	★ Browse Structure Search Insert Empty Drop	23	InnoDB	utf8_general_ci	32 K B	-
staff	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16 K B	-
14 tables	Sum	56	InnoDB	utf8_general_ci	608 K B	0 B

# Integration

- Database software and tools are installed at Cornerstones HQ
- Description of work station:
  - Specifications: Intel Core i7 Laptop using Windows 7 Professional 64-bit
  - Accessibility: User name and password required
- Schedule of Activities:
  - Oct 2014: Licenses obtained, tools installed
  - Nov 2014: Tools tested, database installed, mock data entered
  - Dec 2014: Test database, train Cornerstones staff, update database according to test results

# Test

- All tests performed with mock client data
- Go through Use Case scenarios and verify that all functionality is present
  - Enter new client
  - Update existing client record
  - Enter new household
  - Update household
  - Delete client data
  - Run queries to generate the data as described in the requirements

# Validation

- Verify that all system requirements are met
  - Functional, Non-Functional, Interface
  - Requirements traceability matrix mapping to proper design elements
- Verify that all tests are performed correctly and passed
- Verify that Cornerstones staff display proficiency with using the database

# Handoff





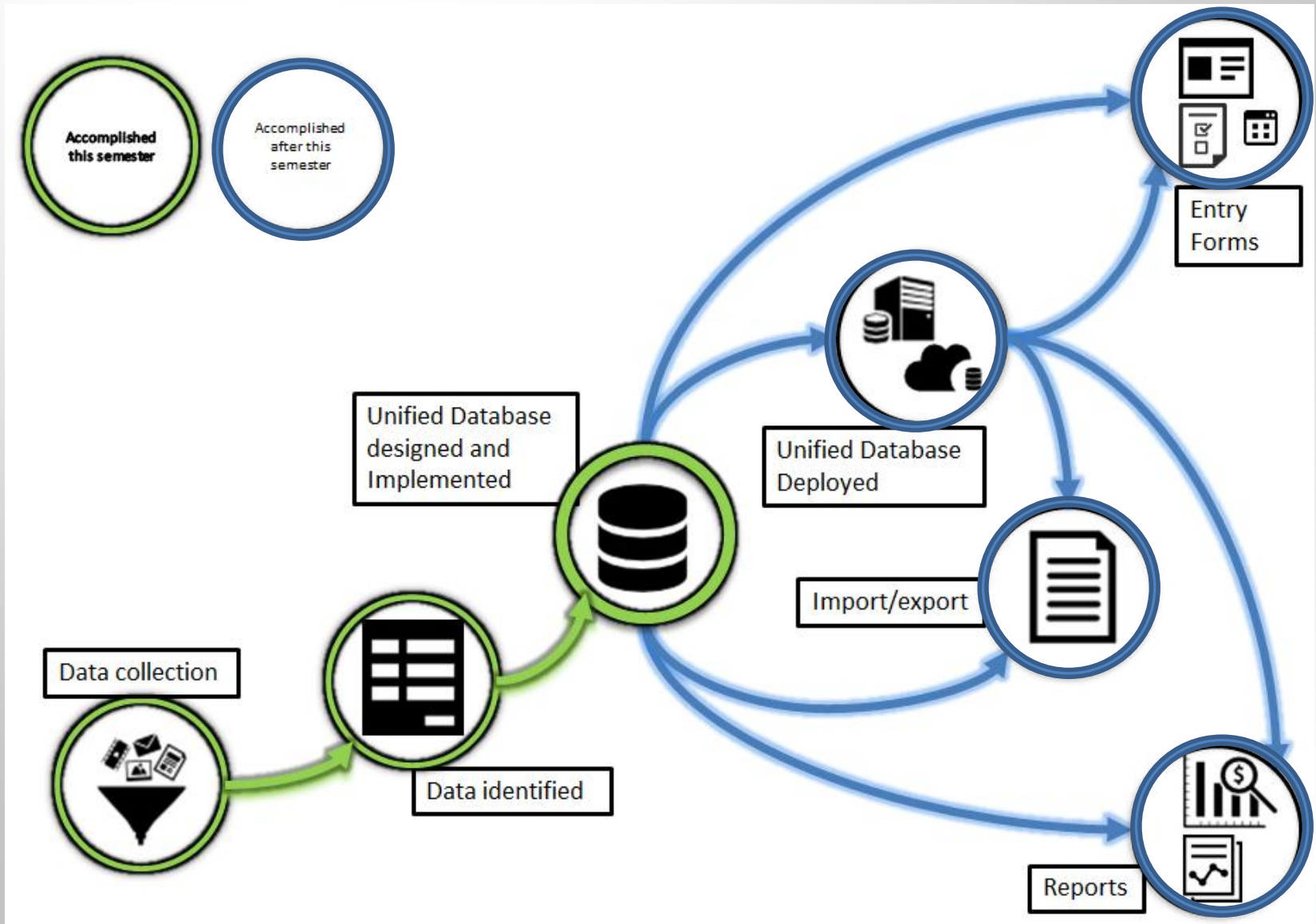
# Acceptance Procedure

- Delivered artifacts:
  - Project Plan
  - Project IMS
  - Requirements Document
  - Design Document (files of design diagrams)
  - Miscellaneous: Meeting Minutes, Status Reports, User access information for all software on test database workstation
- Support during Validation
  - Staff to operate the database as described in the use cases
  - Staff to insert, delete, and update client data

# Benefit Summary

- Reduces manual effort allowing more time to better serve their communities
- Enables them to uniquely identify each client served including repeat clients
- With that identification in place, Cornerstones can identify when clients need more services and what those services might be
- Cornerstones now has a way of seeing how things change from year to year, over various programs and how many of their clients are "one time", how many are "occasional users" and how many use their assistance on a regular basis
- Increases awareness of trends in many aspects of their served community
- Enables more accurate reporting that can help them seek future funding
- Enables determination of critical performance measures

# Future Effort



# Thank you and Questions

- Aisha Sikder
- Abdul Azeem Khan
- Daniel Kim