

Improving Client Outcomes in Human Services through Quality Data

STEPHANIE SHERIDAN

EXECUTIVE SUMMARY

Improving client outcomes is core to the mission of every human services agency. To identify opportunities to improve outcomes, service delivery practices need ongoing assessment and evaluation of effectiveness. Knowledge is critical to this informed decision making process.

Sonoma County Human Services Department (Sonoma) needs the ability to query across multiple data systems in an efficient and timely manner to provide information for decision makers. Alameda County Social Services Agency (Alameda) had circumstances that allowed it to implement a large scale, comprehensive solution to do just that. Given the environmental and cultural differences between Alameda and Sonoma counties, Sonoma's approach should be a little different. Sonoma County should identify its most vital and relevant information needs, and if the benefit justifies the investment, follow an agile development and project management approach. This method provides frequent "sprints" of scoping, development, and delivery as opposed to the traditional waterfall approach of comprehensive scoping and requirements gathering, a long term

development cycle, and big bang comprehensive product delivery or rollout. An agile approach would keep stakeholders involved throughout the process to ensure the end products meet expectations. It would also allow Sonoma County to quickly respond to new and changing requirements. Setting Sonoma up for success would require:

- Executive sponsorship to oversee, champion, and prioritize the project.
- Executive and program manager engagement to identify cross-system information needs.
- Moving the CalWIN County Information Server (CIS) data from a MySQL database platform to a SQL Server database platform.
- Investing in a robust data integration tool; SAP Data Integrator would seamlessly integrate with Sonoma's existing SAP Business Objects Business Intelligence Suite, which is currently used for report development and automated report delivery.
- Allocating existing staff resources from Program and IT to participate in the process.

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Introduction

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Davenport and Prusak (2000) break down the components of knowledge management into three parts:¹

1. Data: "Unorganized facts," discrete findings that carry no judgment or interpretation.
2. Information: "Data plus context," data that has been organized, patterned, grouped, or categorized.
3. Knowledge: "Information plus judgment," a richer and more meaningful perspective derived from experience and the analysis of the data and information.

As it relates to human services agencies, these three components of knowledge management are applied in the following ways:

1. Data are captured and managed in the various operational data systems used throughout the agency.
2. Information is provided when program managers and IT staff work collaboratively to design meaningful reports.
3. Knowledge is gained to inform decision making when program managers and executives interpret the reports using their individual context and experience.

1. Davenport, T., & Prusak, L. (2000) *Working knowledge; How organizations manage what they know*. Harvard Business School Press.

Sonoma needs the ability to query across multiple data systems in an efficient and timely manner to provide information for decision makers. Identifying family connections across programs would allow for better coordination of services, improving client experience. More effective targeted outreach efforts would be possible by pinpointing geographic and demographic similarities. The biggest barriers that human services agencies face in getting accurate, quality data are:

- Disparate formats
- Volume
- Duplication

A typical human services agency relies on hundreds of business systems, databases, and software programs for eligibility determination, case management, and business operations. The systems operate on a wide variety of platforms, with varying levels of input and control at the county level ranging from state or federally controlled and mandated systems to custom in-house developed solutions. There are so much data to sift through that it is difficult to identify the data that are most relevant to the information needed. Data duplication presents one of the biggest challenges, the matching dilemma: How can automated logic determine if Joe Smith and Joseph A. Smith are the same person (e.g. through common address history, birthdate, social security number, etc). Across different data sources, which key(s) should be used to match on?

Is Data Warehousing a Solution?

Data warehousing is a term used to describe the process of gathering data from various data sources, then combining, scrubbing, and matching records into a single source for reporting. A data warehouse is not a quick solution or tool that is chosen, implemented, and forgotten; it is one element of an overall strategy. To fully understand all the implications of implementing and supporting a data warehouse, there are some concepts that need to be understood first—primarily *data management*, *data governance*, and *business intelligence*. In the body of knowledge

FIGURE 1
The World of Data Management



that makes up the world of data management (see *Figure 1*), data governance is the core that provides the oversight and ensures best practices are in place. Having this oversight is key to the information provided having value.

DEFINITIONS:

- The definition of *data management* provided in the DAMA Data Management Body of Knowledge (DAMA-DMBOK) is “the development, execution and supervision of plans, policies, programs and practices that control, protect, deliver and enhance the value of data and information assets.”² The concept of data management arose in the 1980s as technology moved from sequential processing (first cards, then tape) to random access processing. Since it was now technologically possible to store a single fact in a single place and access that using random access disk, those suggesting that data management was more important than process management used arguments such as “a customer’s home address is stored in 75 places in our computer systems.” During this period, random access processing

2. The DAMA Guide to the Data Management Body of Knowledge,

was not competitively fast, so those suggesting that process management was more important than data management used batch processing time as their primary argument. As applications moved more toward real-time, interactive applications, it became obvious to most practitioners that both management processes were important. If the data were not well defined, the data would be misused in applications. If the process was not well defined, it was impossible to meet user needs.³

- **Data governance** is an emerging discipline with an evolving definition. The discipline embodies a convergence of **data quality, data management, data policies, business process management, and risk management surrounding the handling of data in an organization.** Through data governance, organizations are looking to exercise positive control over the processes and methods used by their data stewards and data custodians to handle data. Data governance is a set of processes that ensures that important data assets are formally managed throughout the enterprise. *Data governance ensures that data can be trusted and that people can be made accountable for any adverse event that happens because of low data quality.*⁴ It is about putting people in charge of fixing and preventing issues with data so that the enterprise can become more efficient. When organizations desire or are required to gain control of their data, they empower their people, set up processes, and get help from technology to do so. Data entry issues should be addressed at the source so information is accurate. Data governance also describes an evolutionary process for an organization, altering the way of thinking and setting up processes to handle information so that it may be utilized

by the entire organization. It is about using technology, when necessary, in many forms to help aid the process.

- **Business intelligence (BI)** is an umbrella term that refers to a variety of software applications used to analyze an organization's raw data. BI as a discipline is made up of several related activities, including data mining, online analytical processing, querying, and reporting.⁵

BENEFITS OF DATA WAREHOUSING:

- **Enhanced Business Intelligence (BI)**—Executives and Program Managers have access to data compiled from various sources so they can make business decisions based on complete facts rather than limited data or anecdotal evidence. In addition, data warehouses and related BI can be applied directly to business processes.
- **Saved Time**—When done right, users can quickly access critical data from a number of sources so they can make informed decisions on key initiatives. They will not waste precious time retrieving data from multiple sources and manually compiling to get to the most relevant information. Executives and program managers can query data themselves with little or no support from IT, saving time and money. That means business users won't have to wait for IT to develop reports, and IT can focus on what IT does best, *keeping the infrastructure and business systems running seamlessly.*
- **Enhanced Data Quality and Consistency**, also known as **Data Integrity**—A data warehouse involves transferring data from numerous source systems into a common format. Since all the data from the various data sources are standardized, reports on similar data from different programs will be consistent, increasing confidence in the accuracy of reporting.
- **Historical Intelligence**—A data warehouse stores large amounts of historical data so data can be analyzed for trends in order to make

3. "Data management" *Wikipedia, The Free Encyclopedia*. Wikimedia Foundation, Inc. Retrieved April 29, 2013, from http://en.wikipedia.org/wiki/Data_management

4. "Data governance" *Wikipedia, The Free Encyclopedia*. Wikimedia Foundation, Inc. Retrieved April 29, 2013, from http://en.wikipedia.org/wiki/Data_governance

5. Mulcahy, Ryan, Retrieved May 1, 2013, from http://www.cio.com/article/40296/Business_Intelligence_Definition_and_Solutions

future predictions. Keeping this volume of data in the operational business systems could cause severe performance problems.

CHALLENGES:

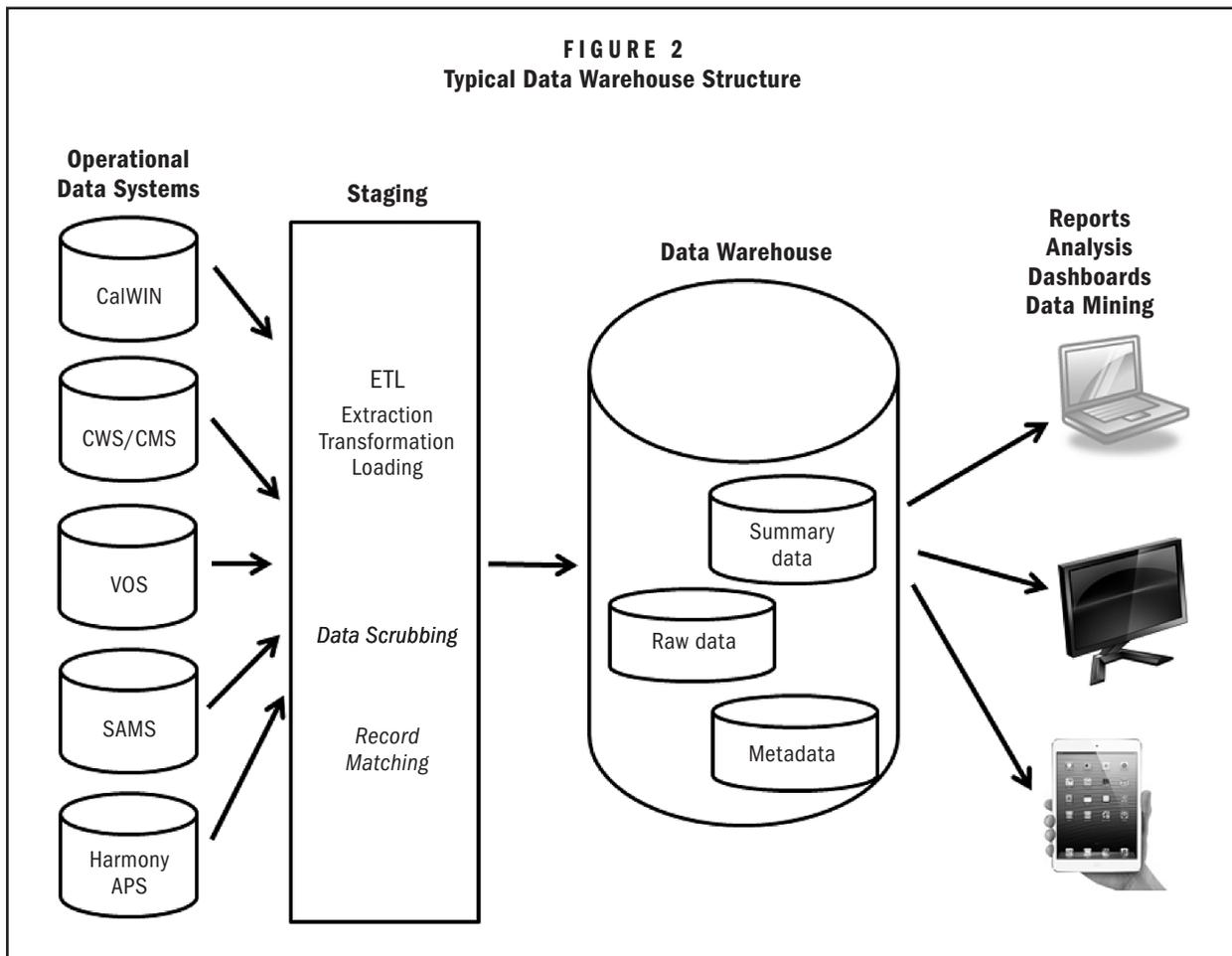
- Resources required to support and maintain (Alameda County employs 12 full-time staff for this purpose)
- Cost
- Data accuracy
- Matching records across different systems
- Complicated data architecture (see *Figure 2*)

Alameda County's Story

Alameda County has a very interesting story about how its Social Services Integrated Reporting System (SSIRS) came into existence. The Deficit Reduction Act of 2005 (DRA), signed into law in February 2006,

affected many aspects of domestic entitlement programs including both Medicare and Medicaid.⁶ One aspect that impacted Alameda County quite significantly was a change to the formula for calculating performance rates related to the Work Participation Rate (WPR). Prior to DRA becoming law, Alameda's WPR was considered satisfactory and ranked fairly high in comparison to other counties. After DRA became law and the new calculation methodology went into effect, its WPR dropped significantly. With potential penalties looming, there was some urgency around having the information necessary to assess and make decisions regarding service delivery in the Welfare to Work (WTW) program of

6. CMS.gov, Centers for Medicare and Medicaid Services
<http://www.cms.gov/Regulations-and-Guidance/Legislation/DeficitReductionAct/index.html?redirect=/deficitreductionact>



the Employment Services Department. Two things gave Alameda County the opportunity to fund an initiative to build a data warehouse. It applied for and was granted a Child Welfare Demonstration Waiver (Title IV-E). Title IV-E projects are funded by the Children's Bureau, and provide states with opportunities to use federal funds to test innovative approaches to child welfare service delivery and financing.⁷ Also, the Annie E. Casey Foundation learned about Alameda County's plans to develop a data warehouse and offered to fund half the project if child welfare data were also included.

Don Edwards, who joined the agency in 2000 as the Director of Information Systems, was promoted to Assistant Director in 2004, and brought a wealth of expertise and experience in big data center management from his past roles with Kaiser and Wells Fargo.⁸ For the data warehouse initiative to be successful, the infrastructure and platform would need to be highly secure and extremely stable. A vendor who could provide a ready-to-operate, turnkey solution of hardware, software, expertise, and training was critical. The intention was for Alameda IT staff to work side by side with the vendor to implement and develop an initial set of reports. This would provide the internal team with the knowledge transfer necessary to maintain and scale the solution and services provided to SSA. Through research and experience, Edwards knew that the IBM Linux and DB2 platform had a proven track record in government, national security, and casino data management.

Alameda enlisted the services of an IBM professional services provider to implement a solution and provide knowledge transfer to internal IT staff over a 6-month period that would set the team up with the capacity to develop further reports and add additional data sources. Alameda settled on an architecture made up of Linux servers, DB2 databases, and Cognos reporting tools. The initial implementation included reports based on CalWIN data for WTW

Workforce Participation Rate, WTW Caseload, WTW Performance, General Assistance Caseload, and a few others. Since that time, several additional data sources have been added, including the Child Welfare Services/Case Management System (CWS/CMS); Case Management, Information and Payrolling System (CMIPS) for In-Home Supportive Services (IHSS); and other in-house data management solutions that allow for cross-data source reports to be developed. Alameda has also been able to integrate SSIRS with the CalWIN Interactive Voice Response (IVR) system to improve client communication. Alameda County currently has data sharing agreements in place between Social Services and Probation, School Districts, Housing Authority, and Health. The data warehouse has also started to drive more inter-county conversation about information sharing.

Goals for the future of SSIRS include more analysis of child welfare outcomes compared to services delivered, improving outcomes and customer service for clients, helping staff by easing work processing, and more interoperability with other tools like Geographic Information Systems (GIS).

How Should Sonoma Proceed?

Alameda County is about three times the size of Sonoma County, giving it more and varied resources. Because of the funding capacity for the project, Alameda was able to engage a vendor for the initial phase and establish a support team of 12 staff: four in Report Development, four in System Integration, three in a Data Management Office, and an IS Manager to oversee the entire system. Sonoma currently has 3 staff with expertise in the necessary reporting and querying technologies, and two staff qualified in data integration and management. Based on culture, size, and environment, it makes sense for Sonoma to start small while ensuring the equipment and software are easily expandable as more needs are identified. The executive team could identify a business need for data, crossing two data systems that would bring significant value to the department. Ideally, an agile approach (see *Figure 3*) to delivering an

7. Child Welfare Information Gateway, a service of the Children's Bureau, Administration for Children and Families, U.S. Department of Health and Services Retrieved April 29, 2013, from https://www.childwelfare.gov/management/reform/waivers.cfm#state_local_ex

8. New Employee Orientation Manual, Alameda County Social Services

in-house proof of concept would be used. The core values of the agile methodology of development and project management are communication, transparency, honesty, incremental effort, and incremental learning feedback.

The agile approach is iterative, providing regular, smaller scope deliverables in “sprints” of “scope–develop–deliver” as opposed to the more traditional waterfall approach, which is sequential and requires significant time in upfront scoping and requirements definition prior to the start of any development. This means a longer cycle of design, development, testing, and implementation with one final product delivered at the end of a very long process.

Sonoma has most of what it needs to deliver an in-house proof of concept, including the basic technology infrastructure, software, and staff. The current infrastructure is Windows Server, MS SQL Server, and SAP Business Objects Business Intelligence Suite. The purchase of SAP’s Data Integrator tool would be the final piece needed to complete a comprehensive toolset to support a data warehouse and business intelligence initiative. It would take a dedicated system/data integrator and a dedicated report developer to work with the program managers and executives who have the specific business need to scope out and deliver a quality product. It could take 4-6 months to get to the final product. Executive support would be necessary to prioritize the work allowing the staff to focus on the project.

In parallel to developing a proof of concept, Sonoma County should work toward developing a strong data governance strategy that ensures consistent processes around data integrity and quality. For example, data inconsistencies and missing data need to be addressed at the source of the business process. There is little value in delivering reports with questionable data integrity or quality; the system must avoid “garbage in, garbage out.”

Collaboration is needed between the executive team, program managers, and IT to define the desired outcomes and goals regarding access to quality data specific to the Sonoma County Human Services Department. If there is sufficient interest in

FIGURE 3
Comparison of Agile and Waterfall Metrics

Metric	Agile	Waterfall
Planning scale	Short-term	Long-term
Distance between customer and developer	Short	Long
Time between scoping and delivery	Short	Long
Time to discover problems	Short	Long
Ability to respond quickly to change	High	Low

pursuing this approach, a more detailed assessment should be done with costs, milestones, and timelines so an objective and informed decision can be made about whether to move forward with a proof of concept. Setting Sonoma County up for success would require:

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