CCHCS EHRS Data Warehouse Project

Trinity Technology Group (TrinityTG) was brought in to assist California Correctional Health Care Services (CCHCS) (referred to as "Health Care Services" or HCS) with its Business Intelligence efforts and lay the architecture for a consolidated Data Warehouse for HCS.

Our initial analysis determined that mapping the various data sources to a single centralized Data Warehouse would be the most challenging aspect of the project. Through this mapping effort we had to address a series of issues related to data quality, the type of data being collected and amount of data being collected.

Other challenges that had to be solved through our innovative solution included the fact that many of the CCHCS data sources had their own set of unique health code sets which required TrinityTG to develop a master code set to be used as part of the Data Warehouse design.

Background

CCHCS currently maintains a data repository of more than one million patients generating daily reports of consolidated data from over a dozen external data sources. These sources provide data which is needs to be used for standard, scheduled, and ad hoc reports. HCS then needs to analyze this information to explore patterns and trends related to inmate demographics, diagnoses, lab results, prescriptions, as well both physical and mental health.

In late 2014, HCS executives approved a project for creating a new Millennium data extract to support ongoing HCS performance reporting, analysis, monitoring, business intelligence and continual improvement. The new Electronic Health Recores System (EHRS) will replace some of the existing systems that feed the current data repository – these "to-be-sunsetted" systems will be retired after EHRS has been fully implemented statewide, expected late 2017.
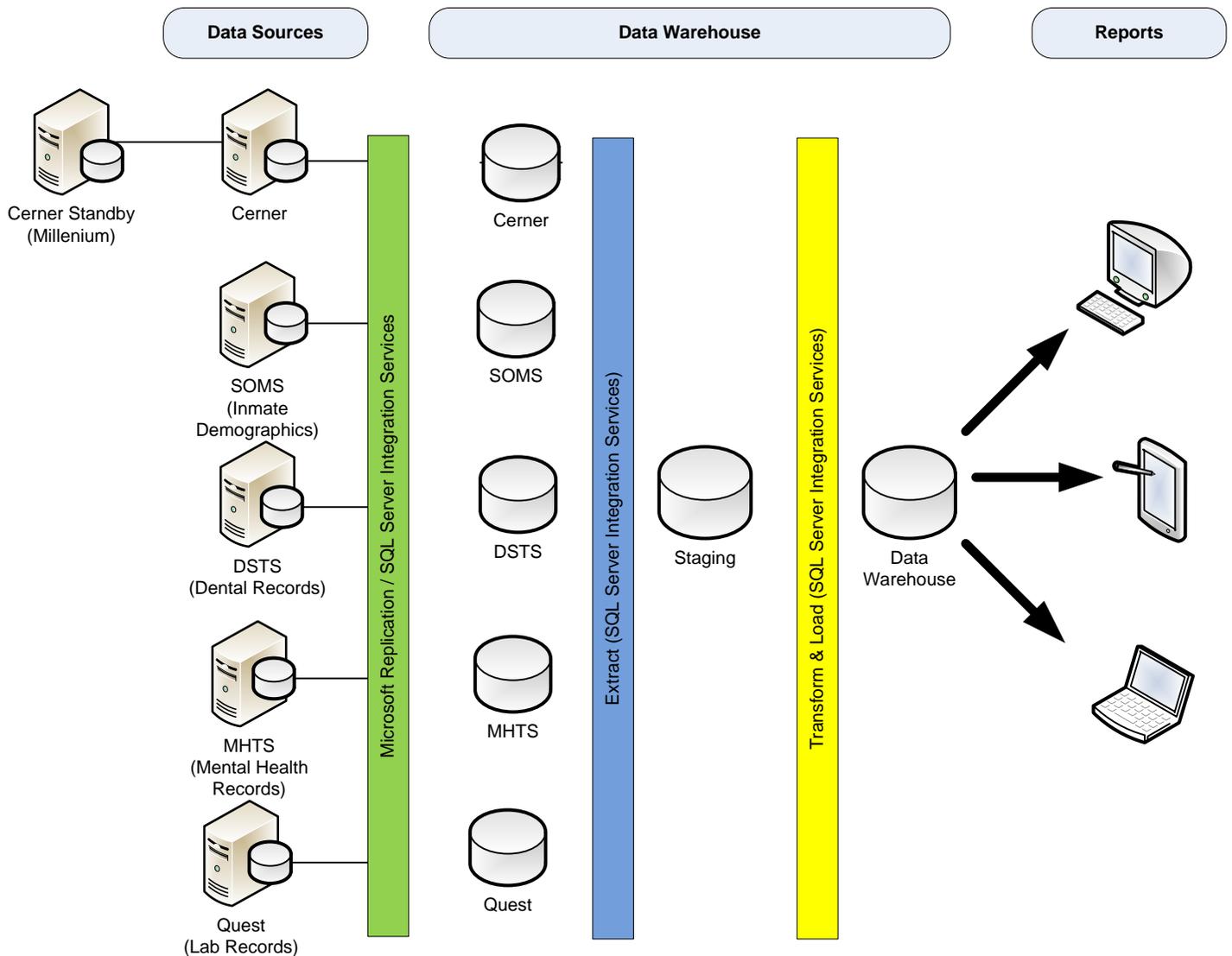
Key Benefits to the Client

- **Build CCHCS Reporting Infrastructure** – Trinity Technology worked with both Cerner and CCHCS Information Technology (IT) staff to build an Oracle Standby that would extract data in real time from the Millennium system and import the data into a CCHCS SQL Server utilizing Oracle Golden Gate software. This infrastructure had to be both scalable as well as provide data from the source to the target in real time.

- **Map Cerner Millennium EHRS System** – We mapped the needed data elements between the Cerner Oracle EHRS System and the CCHCS external data sources. We also integrated Cerner EHRS data with the data from many different CCHCS production systems.

- **Build both a Preproduction and Production Environment –** We built out two environments for Production usage and Preproduction/Development usage, designing

and implementing all of the external Extract, Transfor and Load (ETL) processes from the various sources and migrating all ad-hoc reports used by various reporting departments.

- **Design, and Implement a Centralized Data Warehouse** – TrinityTG mapped all of the external data sources including Cerner Millennium system and many CCHCS legacy data sources into a single centralized database repository focusing on elements that will be utilized to meet HCS reporting needs while performing the ETL process(s) in real time and retaining historical data.

Figure 1. EHRS | CCHCS Data Warehouse Diagram

What We Do

Trinity Technology Group (TrinityTG) is a California-based IT consulting firm. Since our inception in 1999, we have successfully implemented numerous, end-to-end total solutions for our customers. This includes implementation of end-to-end system integration, custom software solutions, COTS products, business process analyses, business intelligence and data analytics projects, enterprise technical architecture planning services, and maintenance & operations support. Our clients are almost exclusively State of California agencies and also include a number of municipal government agencies and private sector firms. Below are some key statistics about our track record of success:

16	95	19	0
Years Providing Services	Full-time Professionals	Number of Clients	Failed Projects

Our Guiding Principles

Our ability to deliver high-quality, end-to-end solutions is based upon three guiding principles:

- **Projects Driven by Business Need** – our solutions are based on client business needs, and are guided by our business process-driven approach to defining solutions that work across organizational boundaries and solve our clients' underlying business challenges.

- **Designed for the Future** – we deliver solutions that emphasize reuse, follow industry standards, and provide a developer's workbench for faster delivery and lower risk. Through our reusable solutions, our clients achieve lower cost of ownership and can adapt our solutions to be used for years to come.

- **Proven Project Management** – we utilize our proven, collaborative project management tools and processes that are based on industry standards and best practices, are transparent, and fully engage our clients.

Our Team

TrinityTG is an employee-centric firm. Our consultants are full-time, ongoing employees that are fully committed to the long-term success of our clients. TrinityTG has achieved a 100 percent project success rate and we are proud of our reputation. Through this approach, we have developed detailed practices in the disciplines of business analysis, testing, training, project management, and others, and we cultivate leaders that deeply understand each client's specific needs and develop strong solutions for success.

TrinityTG also invests in Research and Development and the continuing education for our professionals to increase our knowledge and expertise and stay up-to-date on new technologies and solutions. Our clients benefit from these investments because they enable us to provide them with advanced technologies along with a suite of quick-start tools and capabilities that are based on proven solutions.

Our Approach

The intersection of these principles and our staffing model prepares us to solve the real-world business problems of our clients. Our solutions enable our clients to be successful, and our clients consistently describe TrinityTG as the builder of their mission-critical solutions.

We Build Things - Our projects do not end with white papers. We build and implement impactful IT solutions that solve real business problems, and provide our clients with strong business value. One of our most recent successes was at the California Department of Business Oversight. For this client, we utilized Microsoft Dynamics xRM, SharePoint, and Adxstudios Portal to implement an Enterprise Licensing System with a customer-facing Internet portal that allowed the department to sunset 50 disparate legacy data sources.

We Build for You - For each solution, we determine what will work best for the business user while also aligning with each department's IT policies. We are not a nail in search of a hammer. We deliver a solution that meets each client's specific business and technology needs, rather than having a one-size-fits-all approach. Our diverse portfolio details the wide range of technologies we've implemented to meet an equally broad range of needs. We also employ a strategic approach that focuses on reuse and adaptation, which allows us to implement our solutions faster, at a lower cost, and with less risk. Our agility combined with reuse, and our pledge to provide each client a smart and unique solution, contribute to our 100 percent success rate.

We Build with You - We encourage and facilitate strong collaboration between our team and our clients by working with them to produce formal plans for each critical process. Our team of over 90 highly talented professionals – from business analysts to seasoned developers, from quality assurance analysts to project managers – work hand-in-hand with you to build a successful solution. A project sponsor, after experiencing the "the smoothest deployment" in her career alongside TrinityTG, attributed this to having an extremely responsive and committed team "that truly cared about making [the solution] user friendly."

Trinity Technology Group

Trinity Technology Group has been building working IT solutions that solve real business problems for over 15 years in Sacramento. Our team of talented professionals – from business analysts to seasoned developers, quality assurance analysts to project managers – work hand-in-hand with you to create formal plans for each critical process and to deliver the solution your department needs.

We Build Things. | trinitytg.com