Objective Arts®

Case Study: Leveraging Healthcare Analytics with the AWS Cloud

Objective Arts facilitates a "data partnership" between San Bernardino County and one of its largest providers, the Victor Organization, enabled by Amazon Web Services Cloud. This partnership allows payers, providers and clinicians to maximize the appropriateness of treatment while at the same time minimizing its cost. Our software facilitates faster, more effective decisions by focus-ing on what software does well: aggregation, analysis and visualization. When you deliver timely insights, human decision makers can continue to focus on what they do, but with better results. This is the story of how Objective Arts has enabled San Bernardino to implement the County's vision of using data to serve clients and control costs.

Aggregation 01

Analysis 02

Visualization 03

When the CANS (Child Adolescent Needs and Strengths) assessment arrived in the mid nineties, it provided a fresh approach for understand-ing patient need and treatment. Widely adopted as a pen-and-paper tool, the CANS created a common language for clinicians to discuss the behavioral health needs of individual patients. The CANS is adopted world-wide as a tool for driving individual patient outcomes and rational-izing cost. However, what San Bernardino wanted to accomplish in terms of data visualization and analysis simply wasn't feasible with the pen-and-paper CANS.

Objective Arts worked collaboratively with San Bernardino's Timothy E. Hougen, Ph.D. to implement a unique CANS data visualization model, a model which offers several major advantages over the pen-and-paper approach. Dr. Hougen oversees a wide array of programs, many of which are implemented by Victor. He needed a more data-driven and scalable way to map children to the correct program and program intensity. To begin with, we displayed the patient's most recent score in the context of their previous scores, so that trends, clusters and patterns were immediately visible. We've rendered the spotting of outlier data points effortless through this display. With trend data in hand, we can give the clinician critical context that helps them decide if a data point represents extreme need or some sort of data collection error.

The Box Score: Analysis, Aggregation and Visualization of CANS results

The Box Score visualizes individual patient CANS assessments, and provides at-a-glance comparison with aggregate populations of patients. In this case, the patient history is compared with the distribution of patient scores typically found within both high- and low-cost treatment alternatives.

Aggregate: High Cost

This is the distribution of all patient scores from within a higher-cost treatment option. The bar represents one standard deviation, with the mean in white.
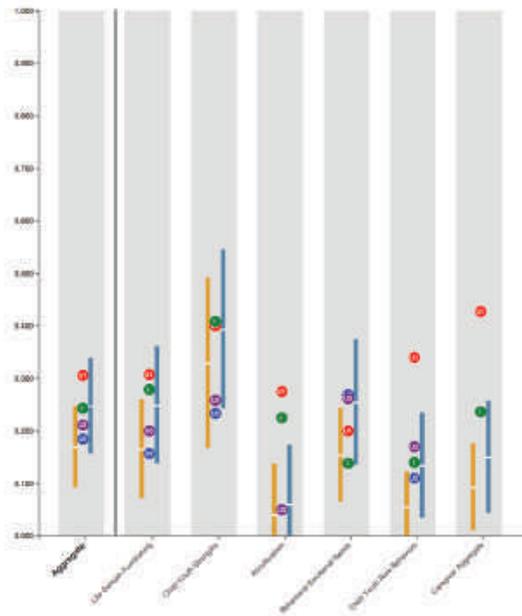
Aggregate: Low Cost

This is a distribution bar showing the aggregate range of all patient scores within a lower cost, lower intensity treatment option. The bar represents one standard deviation, with the mean in white

Individual Patient Scores, Over Time

Each dot maps one patient's CANS score at a particular time period.

■ Initial (Time 0)

■ Update 1 (Time 1)

■ Update 2 (Time 2)

■ Update 3 (Time 3)

CANS score, higher correlates to greater need

Furthermore, while the Box Score is computed using the CANS as a whole, it is also broken down into separate scores for the various sections of the assessment. This breakdown provides clinicians with important guidance about fine-tuning treatment. For example, one patient may have severe need in one particular area while another might have scores that are more generalized. Once again, software's ability to visualize data makes that data more accessible and more useful to human decision makers.

Another important feature of the Box Score is the ability to see how a particular patient's data compares to the total of other patients, in aggregate. Patient need is quantified and placed in the context of all other patients across San Bernardino County. This quantification of need targets the reduction of over- and under-treatment throughout the county. For example, one clinical practice might see patients with greater average need than another. Comparing scores across these practices allows for more efficient allocation of county-level treatment resources in a way that simply wasn't possible before. The CANS model has always been designed to be both a clinical tool for improving patient outcomes and a tool to use when making decision at a higher organizational level; now we've created a tool that facilitates both of these goals.

Our platform provides an additional level of contextual information, namely the aggregate scores of patients in different subgroups, such as varying intensities of treatment options. For example, San Bernardino has contextualized each score by comparing aggregate information about entry level/low intensity programs and high needs/high intensity programs. A clinician can see instantly how their patient compares to the range of patient scores typically catered to by each option. This sub group data helps to further fine-tune clinician decisions on treatment levels to minimize over- or under- treatment. San Bernardino County is embracing the potential of these techniques as an opportunity to positively impact patient outcomes.

Scores can be broken into components, like the individual CANS strenghts areas, and again compared to aggregate patient populations.

At a higher level, Objective Arts' tools have provided a new opportunity to measure and rate effectiveness of providers throughout the county. Now payers can compare 'apples-to-apples' how a given treatment option or provider actually impacts patient outcomes as a whole. This comparison wasn't possible with access to only individual CANS scores. Objective Arts software has extended a simple model into a powerful framework for managing patient outcomes, treatment right-sizing and efficiency. **AWS allowed that solution to scale rapidly to meet the needs of the Victor Organization, across California.**

Finally, every piece of data in the Box Score can be configured to fire notifications based on its value. Not only can a provider see that a patient is likely high-risk, but they can also preconfigure electronic notification to those people who can mitigate that risk the fastest. The system will hold those tasked with intervention accountable for their responses. If the system is not told that risk mitigation has been implemented it will also notify on the lack of action.

Objective Arts has given San Bernardino County and the Victor Organization a new way to guide decisions, taking an existing model and extending its utility. OA's tools make it possible for those organizations to analyze, aggregate and visualize data in alignment with their visions. The partnership provides context and guidance for payers, providers and clinicians to improve patient outcomes, optimize treatment levels and reduce costs. We help people and organizations use their data to make smarter decisions, ones that will produce maximum benefit to all involved.