

Corrections Business Intelligence: Safety in Numbers

By Laura Buring, Don Pack and Paul Schroeder

Governors, legislators, correctional administrators, employees, media, citizens, victims groups ... stakeholders, partners, watchdogs ... all demand information about the business of corrections. Requests from external and internal stakeholders deserve a quick and accurate response. After all, information in the business of corrections may have serious public safety or political implications.

Responding to these requests may require staff to scramble for information from knowledgeable employees, and those who have the ability to access data are particularly valuable. With business intelligence systems now on the scene, consistent, accurate and efficient data is at correctional administrators' fingertips. Business intelligence systems give users the ability — on their desktops — to gather, manipulate and present data.

DEFINING THE NEED

Many states are seeing an increasing demand for performance measurement and evidence-based programming in corrections. Meeting these demands also requires an agile and robust reporting system. Most states are using older information systems and analytical tools that require a lot of staff time and expertise. How do correctional agencies address these issues when solutions seem to require a large influx of funding and staff expertise?

The Oregon Department of Corrections found a solution to these problems that did not require a large funding increase or many additional experienced staff. During the last several years it has been using an iterative, or building block, approach to constructing a data warehouse and reporting system that is meeting the needs and expectations of the agency's internal and external customers.

PLANNING

The first step in successfully implementing a business intelligence system is to take stock of where the organization currently stands. This involves evaluating several areas: the skills of the analysts who report data, the tools available to these staff, the level of funding for the effort and the support of agency executives. Oregon took a hard look at its situation before starting a business intelligence project and found:

- Staffing: Two Information Technology (IT) positions dedicated to the effort, consisting of one vacant position and one existing employee with experience in reporting for the DOC and some IT experience but none in Web-based reporting systems;

- Tools: Use of the same type of hardware and software used for the agency's other information systems;
- Funding: Some funding available for purchasing additional tools; and
- Support: High-level executive support for funding and staffing the project.

The implementation team felt that the areas of staffing and tools needed to be carefully addressed in order to be successful. First, the hardware and software was replaced with tools designed for reporting systems. New hardware was purchased that would optimize the speed of report generation. On the software side there were many tools available that generally fell into two categories: 1) "Best of Breed" in which software from different companies is chosen based on success in a particular segment of the overall process or 2) "Single Vendor" in which all data warehouse tools are purchased as a suite from one vendor.

Oregon only had two staff to learn the new software and research analysts were already using statistical tools from SAS, a company that creates business intelligence software. The team decided to leverage existing skills and tools by purchasing additional software packages from SAS. Second, to complement the team's skill set, an employee was hired who had system development experience leading IT projects in government and who respected the needs of the agency's information consumers.

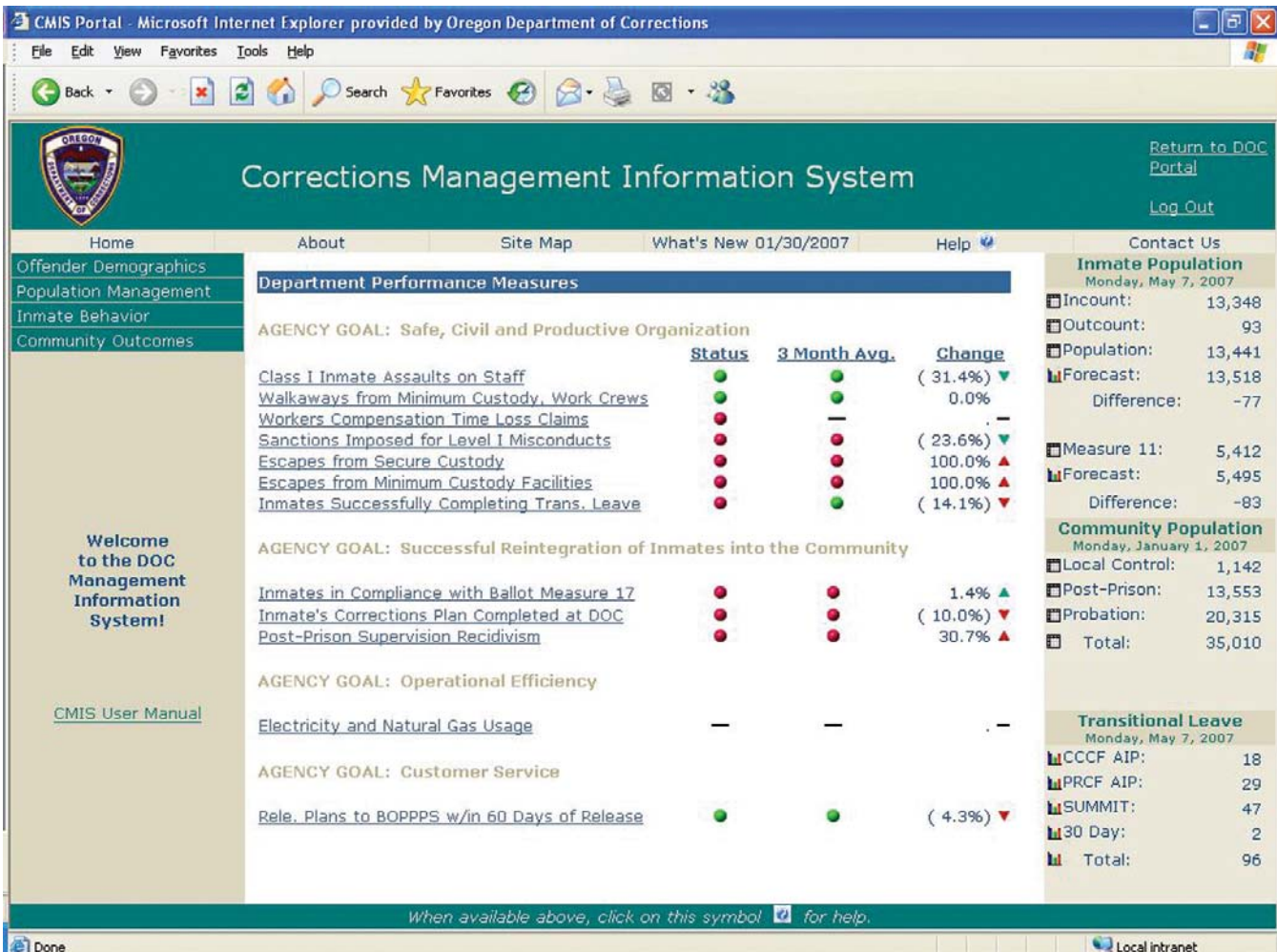
PROOF OF CONCEPT

Once the staff and software were selected, the Oregon DOC wanted to be sure that the software solution was a viable one. A proof of concept was proposed by the vendor to demonstrate the capabilities of the proposed software in the Oregon IT environment. Various reports were requested and successfully produced that used the Oregon DOC data and highlighted the flexibility of the software. These were presented to upper-level managers who subsequently approved the software purchase. As a collateral benefit, team members observed and learned during the pilot and came away with a working version of the reports and graphs. In the end, the modest price of the pilot project paid off by assuring the staff that the project was headed down the right path.

NEW REPORTING INFRASTRUCTURE

After the software purchase was approved and completed, the DOC began to implement a live reporting environment. Much of the setup had been implemented during the pilot phase but needed some enhancements to be reliable

Figure 1. Quick-Fact Information on the Oregon DOC Web site



enough for everyday use. Nightly data downloads were created and scripts were written to monitor automated processes and fix any incorrect data.

During this phase, staff also were trained how to use the business intelligence software. Much of their time was spent rewriting existing reports for use in the new system. The new reporting infrastructure allowed staff to do all the steps involved in creating reports in one software application, instead of the multiple applications they had used in the past. This resulted in great improvements in data consistency, accuracy and completion time.

AUTOMATED REPORTING

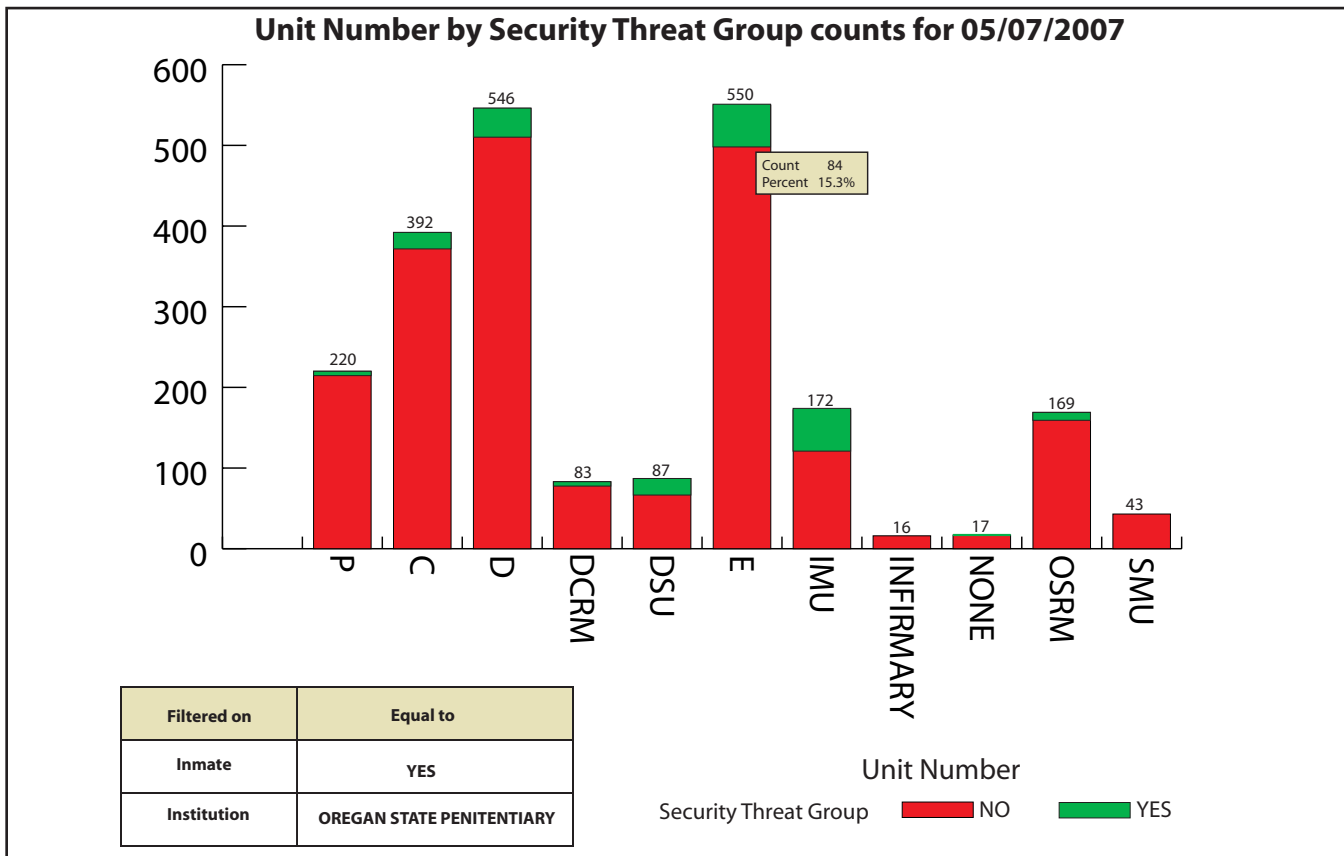
The natural progression from reporting proficiency to automation of routing reporting was achieved in the next phase. By using the same scheduling capabilities that are used to replicate data nightly, reports could now be generated automatically without any human intervention. Additionally, it was easy to generate reports in different formats according to the specific needs of the user — spreadsheets, Word documents, Adobe Acrobat documents and others. These documents attach to an e-mail and are sent directly to the requestor, completely bypassing analysts in the process. Many weeks of staff time each month were saved by automating these reports, freeing up staff to do more skilled tasks.

QUICK FACTS ON THE WEB

Although it was tempting to skip previously mentioned steps and move directly to a Web-based reporting system, the team and project definitely benefited from moving gradually into this phase. Once the infrastructure was in place and analysts gained experience in producing ad hoc reports, it was easier to begin building a business intelligence system. In Oregon, the Corrections Management Information System (CMIS) started with simple quick-fact information accessed from a portal page (see Figure 1). Frequently used statistics such as inmate and community populations and forecasts are posted on this page and display more detail when clicked on by the user. The new standard reports provide more detail about the demographics of offenders at individual prisons or community corrections offices. Additionally, all reports can be reproduced in a Word document or spreadsheet with the click of a button, adding ease to printing, e-mailing, additional manipulation or use in other documents.

Starting small with CMIS enabled the IT staff and users to gradually acclimate to this new technology environment. The analysts were working with new tools and learning new skills, while the users were getting used to accessing the system and its features. It was designed for easy access, use and understanding by a variety of users across the Oregon DOC and community corrections offices. Data is

Figure 2. Security Threat Group Distribution Across Units at the Oregon State Penitentiary



consistent throughout CMIS so that any information reported from staff across the agency will be the same. Through the implementation of this technology, the workload of the analysts decreased substantially as users answered many of their own questions directly.

DYNAMIC POPULATION REPORTING

Progressing from static information to dynamic query capabilities was a major enhancement to the initial CMIS effort. At this point, agency managers and staff were becoming familiar with the capabilities of a Web-based system. They were able to articulate general needs but were not sure what additional enhancements were possible.

The CMIS analysts decided to add some new, more customizable features and reports to the system to generate information they knew would be useful and would reduce analysts' ad hoc query workload. For example, staff often need to know the demographic characteristics of a certain subset of offenders, not the entire DOC population. To enable this query, the team created interfaces in which selections could be made to filter to subpopulations based on a combination of demographic factors. Questions such as, "How many female, minimum custody inmates have substance abuse or mental health needs?" could be easily answered by any staff member for citizens, the media or the Oregon Legislature. This ability removed the pressure on analysts to generate the information and empowered public information officers and other staff to answer questions quickly and easily.

As staff became familiar with these new reports they found creative ways to utilize them in their work. For example, if a prison unit experienced unexplained disturbances, staff could use this reporting capability to look at common disruptive factors like age or security threat group affiliation to see if they were different than for other units in the prison (see Figure 2). Also, community corrections offices started generating and using a list of inmates soon to be released into the community. This list helped county staff determine which inmates should be provided "reach in" services to assist with their transition into certain community programs. Counties with security threat group or sex offender programs, for example, could find out for themselves which inmates they needed to work with before, during and after the transition.

REDUCING THE REPORTING WORKLOAD

Once a significant number of reports were available in CMIS, the team shifted focus toward re-creating reports that were being generated by individual business experts. Collecting data and generating these reports had been time-consuming activities for those staff and had kept them from other duties. CMIS offered an excellent solution; specific report parameters were built for the needs of individual reports to allow users to access current or historical information, select certain locations for reporting or apply other relevant criteria. These enhancements meant information would be available in a timely manner throughout the department and would be consistent in all locations.

PERFORMANCE MEASUREMENT

As an organization matures in its use of information, it moves from mere reporting of aggregate data toward performance measurement. Objectively analyzing how effectively it is doing business and achieving goals replaces the “gut feel” indicators of the past. A business intelligence system can significantly aid this effort by providing information to the organization in a variety of ways from executive-level views down to the most detailed supporting data.

The Oregon DOC has benefited from performance measurement automation with its department-level measures, institution critical indicators and community outcome measures. Starting with the executive-level view, red, yellow and green traffic-light-style indicators are automatically generated based on the performance of a county, parole/probation officer, or institution relative to a benchmark, statewide average, comparison with other locations or past performance. Aggregate information used to generate overall scores are displayed as graphs and tables as well. All DOC and county community corrections employees have access to the current performance measures.

Scott Taylor, Oregon’s Community Corrections chief, elaborates on the benefits gained from performance measurement reporting. “The community corrections directors in Oregon were interested in more immediate feedback concerning the management of cases within their offices. We used the performance measures they had adopted as a starting place. The stoplights allow us to see instantly how each office and officers compare with others in the state. We can quickly see those areas in which we are strong and those that need improvement.

“This process has also greatly increased the data entry accuracy in that the information is shown by individual, and thus, bad data is quickly corrected,” Taylor added. “Since each performance area allows for digging down to the offender level, it allows for a quick easy way to monitor performance and trigger deeper review or conversations where appropriate.

“The addition of community criminogenic assessment screens, case planning tools and the risk of rearrest report augment officer and supervisor quick checks on where resources might need to be allocated. These resources range from officer time to new contracts for treatment slots. We now can spend less time in an audit process and more time recognizing levels of performance,” Taylor concluded.

The goal of these reporting features is to enable counties to excel in the management and supervision of offenders. As Taylor mentioned, detailed reports are supported in the executive- and manager-level summary information in CMIS. One of the objectives of community outcomes reporting is to provide information appropriate to a variety of staff in 36 county offices. Consequently, the ability to click on information in a high-level report and see the data that produced those numbers was added as a feature. It was an easy way to provide additional information that can be seen only if someone chooses to take that next step. Having a red or yellow indicator on a measure also leads staff to correct data entry errors, which increases the quality of these reports as well as others based on the same information.

NEXT STEPS

A Web-based reporting system has endless possibilities for future enhancement. The business of corrections is very complex with many types of data that can be brought into a data warehouse. Information about expenditures, staffing, offenders and recidivism rates all can be presented together in a context that enables managers to see an enterprisewide view of information that had not been available before.

Information can also be viewed differently with the infrastructure and tools that are now in place. New software can easily be added to the existing set, adding capabilities such as dynamic population impact analyses, forecasting, or finding operational efficiencies such as the best location to house offenders or treatment programs. Evaluation of correctional programs is easier and more robust with agency-wide information in one system.

Additionally, mining into data allows better prediction of future offender behaviors like misconducts, violations of supervision, rearrest or new convictions. Because of the data warehouse’s flexibility, Oregon has been able to develop an Automated Criminal Risk Score that predicts the probability that an offender will recidivate, a conduct factor that is integrated into the inmate classification system predicting likelihood for misconduct in prison, and an arrest risk report that shows which offenders on community supervision are more likely to be rearrested.

With an architecture created specifically for reporting and the experience of the CMIS team and research analysts, agile reporting is now a reality for Oregon. Data is cleaned and stored in a way that makes future work much quicker and easier. New reports have been developed in CMIS alongside working committees, allowing members to see the impact of their policy changes and adjust accordingly. Without an agile system, these members would have had to wait until decisions had been made and information automated before they could see the impact of their policy and process changes. These are a few of the ways that Oregon is working toward operational efficiencies, safer prisons and better supervision of offenders through business intelligence.

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