



SECTION 1: COVER

Title: Taking the Pulse of a Prison – Prison Dashboard

Category: Improving State Operations

State: North Carolina

Contact Information:

Robert S. Brinson, CIO

North Carolina Department of Public Safety

2020 Yonkers Road, Raleigh, NC 27699-4217

Bob.Brinson@ncdps.gov

919-324-6101

Completion Dates:

Requirements/design session completed: 3/17/2016

Phase I: Software Development Complete: 5/27/2016

Phase II: Health Services Dashboard Complete: 12/29/2016

SECTION 2: EXECUTIVE SUMMARY

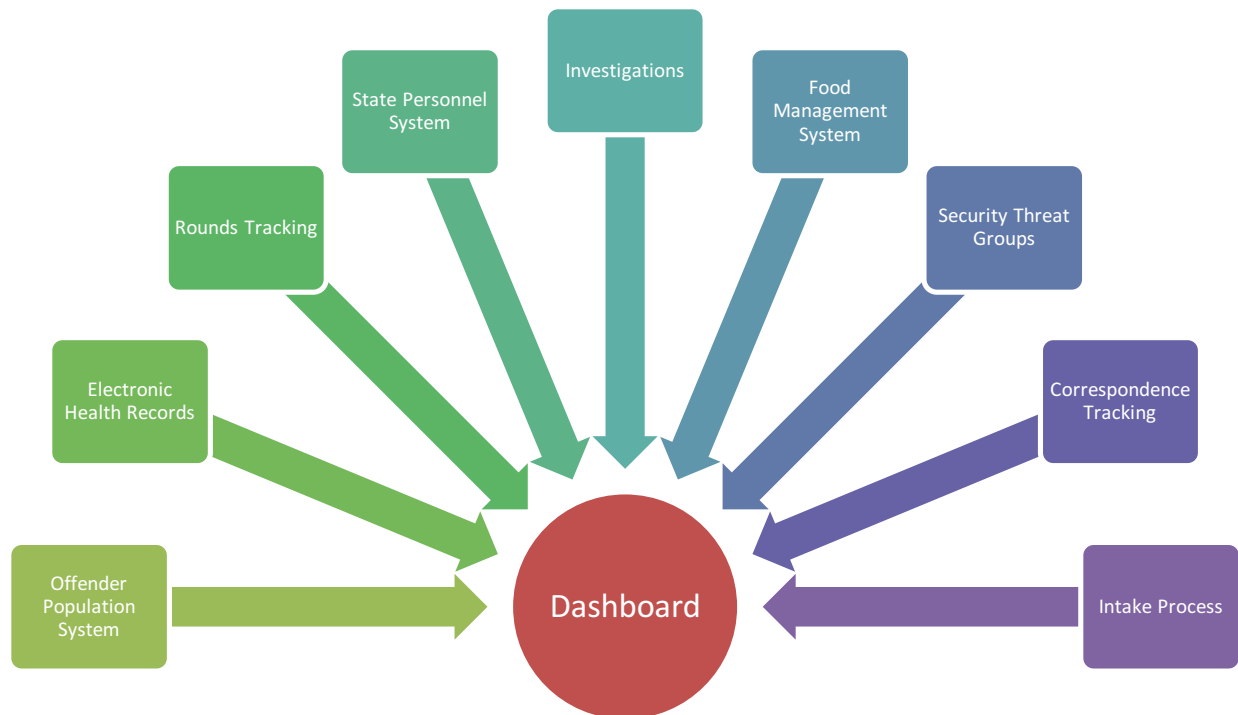
Prisons are challenging environments to manage safely and professionally. All the activities of daily life: work, education, health care, food service, transportation must be conducted while remaining highly focused on the security and safety needs of both the inmates and staff. Immediate access to a wide range of information is essential to the efficient daily operation and maintenance of the organization. A breakdown anywhere in the system can have serious consequences. Unfortunately, at NCDPS, as in most large operations, this data is not managed in a single, unified manner. A host of systems are utilized, including proprietary applications, vendor products and statewide offerings, each specializing in a different aspect of the business. As a result, direct service personnel are only familiar with the few specialized applications relevant to their work area. Therefore managers must log into a dozen different applications to obtain a full understanding of a single prison facility's operations. This problem is made more difficult for regional and upper management staff who have up to 50 facilities under their jurisdiction because the data is stored at a facility level. Compounding the problem of integration is that the applications operate on different platforms with diverse technologies and interfaces, ranging from CICS to web-based to Android. This hampers the synthesis of information across systems. For example, it has traditionally been difficult to reconcile medical orders for wheelchairs generated from the Electronic Health Record with the availability of handicapped-equipped cells, which is controlled by facility management. Fragmentation of the data storage also prevents comprehensive searches for common information, such as telephone number, across the various data repositories.

As a manager of the facility, our Dashboard has given me the most complete "snapshot" of our facility's actually day to day business that I have ever had. Within moments, I can see a variety of issues requiring follow up, either from me personally, or from one of our various managers. It has also increased overall productivity for managers at all levels.

Easily, this is one of the most significant technological tools provided to me as a manager in the last 15 years.

John Hamlin IV, Correctional Facility Administrator

The NCDPS Prison Dashboard addresses these problems by gathering critical metrics from more than a dozen systems and presenting them in a single, clear and intuitive format. By working directly with correctional professionals from across the state, IT was able to uncover the most essential elements from each system. We then joined with Superintendents and management to combine the data in meaningful ways. For example, DPS policy restricts the number of days that an inmate with Mental Health Issues can spend in restrictive housing per year; prior to the Dashboard it was difficult to determine which inmates were covered by this policy and even harder to calculate the cumulative number of days. The Dashboard combines the health record and the custody information directly to provide an instant list of inmates in danger of exceeding the threshold.



The Dashboard is also able to provide richer understanding of the data by incorporating graphs and charts in the interface. Trend analysis and data comparisons are presented cleanly and clearly. Timelines, organization charts and multi-year calendars are also used to transform complex data into meaningful presentations. All the charts are fully interactive to reveal the underlying data. When even more detail is required, users can link directly back to the source application. This is made possible by leveraging single sign-on technologies and working with other developers to build fully qualified requests that allow the user to jump to the precise location within the primary source application.

SECTION 3.1: BUSINESS PROBLEM

NCDPS adopted its primary offender system, OPUS, in 1994. This large COBOL based system has served the department well and has captured huge amounts of inmate information. Yet with its CICS transactional format and numerous functional areas (e.g. Banking, Transportation, Disciplinary, Job and Programs), it requires specialized knowledge to operate. As a result, information from each area has been often maintained within departments and not shared between groups. Over the intervening years, NCDPS has added numerous new web-based systems to replace CICS modules and to address new needs. However, in following the pattern of duty segmentation, these applications have often been highly specialized with a well-defined user base. Kitchen personnel and dietitians use the *Food Management System*; maintenance personnel use the *Maintenance Management System*; gang officers use the *Security Threat Group Application*; and so on. As a consequence, administrators have had to largely rely on their section heads to provide them with basic information about their facility. This is both inefficient and labor intensive. Also, without easy access to comprehensive information, it has been very difficult to identify trends and spot areas of concern before more significant problems develop. Even technologically savvy managers who were willing to log into multiple systems were often frustrated by the time and effort it took to retrieve basic metrics. In the spring of 2016, Prison Superintendents, Regional Administrators and Upper Management Personnel asked the IT department to come up with a better way to provide more complete and timely oversight for their facilities.

SECTION 3.2: SOLUTION

While it quickly determined that a Dashboard format would be the optimal solution, NCDPS was unable to identify any commercially available Business Intelligence products that would adequately meet the requirements. Key performance indicators varied greatly through the systems and specialized understanding was necessary to analyze and link the data. Also, without an intermediate data warehouse layer, special consideration had to be given to minimize degradation of primary systems. Another considered alternative was building APIs into each of the silo-ed applications so the Dashboard would simply call to retrieve the data from each and display it in a central location. While this would have the benefit of ensuring that the business rules could be maintained in the primary application, it would require a large effort by numerous developers to add new APIs to each of the 60+ existing applications. Also, adding an API to the vendor products in use would require an expensive and drawn out change management process. Likewise, getting the data through primary source hosted APIs would limit our ability to leverage cross pollination of data. Each system would only report on its own data, rather than integrate this information with data from other departments.

In the end, it was decided that the best approach would be to develop a dedicated application using an existing DPS Java framework and augmenting it with new presentation technologies for charting and data manipulation. By using the existing framework, coding time was significantly reduced, and the resulting code base is easily maintainable by multiple developers. It also allows NCDPS to use a single sign-on methodology, which enables users to transfer over to the primary source applications directly with their credentials intact; therefore, they do not have to log in again and can go directly to the appropriate location in the application.

Reports | Searches | Applications | Admin | MIS | Logout

Refresh

Pending Approval		Outside Movements	
Control - Division	1	Court	7
Control - Facility	8	Hospital	5
Control - Unit	3	Leave	0
Custody	42	In-Transit	0
Home Leave	1	Scheduled Transfers In	2
Jobs/Programs Referrals	27	Scheduled Transfers Out	12
Mail/Money	4	Backlog Transfers In	8
Modified Housing	16	Backlog Transfer Out	127
RHDP Pending	730	Medical Hold	103
Special Meal	1		
Visitor	128		
Correspondence	853		
Grievance	83		
Incidents Awaiting Facility Approval	394		
Incidents Awaiting Regional Director	2		
Incidents Awaiting Review Authority	232		

Past Due	
Admission Processing > 30 days	5
Unassigned > 30 days	223
Positive Drug Test within last 30 days	1
No drug test in last year	26
RHAP within 2 days of ending	1
Restrictive Housing/Control Expired	1
Less than 24 checks on last full day	4
No Recreation > 14 days	1
AOC Alerts > 30 days	10
Overdue Classifications	3
Upcoming releases w/unresolved home plan	18
MHSI Referral > 5 days	52

Alerts	
Projected Release < 30 days	121
MH inmates on RH > 30 days in year	3

Disciplinary Investigations	
Assigned	2
Under Investigation	79
Investigated	31
Refer To DHO	22
Appealed	3

Special Populations	
CRV at non-CRV facility	25
Home Leave	6
Sex Offenders	52
MAPP Agreements	1
TDU Phase 1	12
TDU Phase 2	1
SRG Validated	7
SRG Associates	6
Security Alert Inmates	4
ASR	8
Death Row	3
Life	50
Post Rel 3M Reimprsn	7
Safekeeper	36

Health & Safety	
Inmates Needing Lower Bunk	47
Inmates Needing Wheelchair Access Cell	6
Missing Medical Grades > 15 days	7
Missing Dental Grade > 15 days	6
Missing Mental Health Grades > 15 days	43

General	
DOP Facilities Management	533
Medical	1
Vehicle And Radios	17

Total Beds (Filled + Vacant + Held) : 1,728

Restrictive Housing

Population

Closed Incidents and Injuries by Month

Guilty Disciplinaries by Month

Vacancies

*See Appendix for larger charts

Since the Dashboard's primary goal is to retrieve a large number of key indicators simultaneously, performance was always a preeminent concern. The application utilizes asynchronous Ajax Requests to maintain a quick response time by allowing multiple concurrent threads to fire simultaneously. Straight jdbc connections with native SQL are also used to allow queries to be tuned for maximal performance.

Working directly with the clients and primary source developers, we were able to distill the information presented to the most meaningful and salient elements. However, all top level totals are immediately expandable with a single click to display a table of underlying data. All tables can be printed as a PDF or exported to Excel. Moreover, the user can select any row and directly link back to the primary source application. This process ensures that both immediate operational and 'deep-dive' needs are satisfied.

Positive Drug Test within last 30 days

Show 15 entries Filter

OPUS #	Inmate Name	Bed/Cell	Admission Date	Drug Test Date	Specimen #
019809	Morales-Mosqueda, Guy [obscured]	B1B- 13	10/05/2016	11/22/2016	M00222443
055148	Poirier, Casey [obscured]	JPODC033	06/03/2015	11/22/2016	M00222436
055148	Poirier, Casey [obscured]	JPODC033	06/03/2015	11/22/2016	M00222436
062741	Vallejo, Randy [obscured]	KPODD015	05/30/2008	11/26/2016	M00222562
067635	Wooten, Broderick [obscured]	JPODC045	05/06/2009	11/22/2016	M00222435
067635	Wooten, Broderick [obscured]	JPODC045	05/06/2009	11/22/2016	M00222435
071344	Santana-Duque, Titus [obscured]	MPODH001	01/17/2014	12/10/2016	M00224185
086293	Christmas, Jeremy [obscured]	LPODD011	04/29/2016	11/23/2016	M00224062
131962	Maldonado-Madrid, Cody [obscured]	NPODA016	09/08/2014	12/05/2016	M00223222

Showing 1 to 9 of 9 entries Previous 1 Next

Print Excel PDF Close

Ninety percent of the data presented is real-time; however, for trend analysis and a few high intensity queries, some of the processing was off-loaded to non-peak batch jobs. Items that are less frequently requested and/or more specialized interest are accommodated under a reports section. The reports still retain all the features of the main item and allow users to print, export or link back to source material.

OPUS ONLINE Alexander CI Dashboard SRG Report WOODLOCK, JOHN K. 3010 - NC CI WOMEN

Security Threat Group Breakdown

Gang	Level	OPUS	Inmate Name	Facility	Cell Id
Five Percenters	Threat Level 3	012231	Wholers, Mike [obscured]	Alexander CI	LPODB044
Five Percenters	Threat Level 3	075297	Brownson, Steve [obscured]	Alexander CI	JPODC031
Crips	Threat Level 3	006191	Voorheis, Archie [obscured]	Alexander CI	NPODA007
Crips	Threat Level 3	040251	Muniz, Clinton [obscured]	Alexander CI	JPODF004
Crips	Threat Level 3	052047	Eldridge, Nakia [obscured]	Alexander CI	LPODC040
Crips	Threat Level 3	056323	Agullera, Johnathan [obscured]	Alexander CI	KPODF014
Crips	Threat Level 2	065484	Loray, Darius [obscured]	Alexander CI	KPODD046
Crips	Threat Level 3	072852	Shytle, Jill [obscured]	Alexander CI	KPODA037
Crips	Threat Level 1	074749	Pounds, Walter [obscured]	Alexander CI	B1A- 36
Crips	Threat Level 3	076607	Burnett, Sean [obscured]	Alexander CI	B1A- 50

Showing 1 to 10 of 190 entries Previous 1 2 3 4 5 ... 19 Next

Print Excel PDF Close

The presentation layer makes extensive use of jQuery, DataTables and Google Chart Elements. By using these widely adopted technologies we were able to ensure that the application is compatible across browsers and device types. It also has greatly expedited development with many popular features such as filtering, sorting and creating PDFs and Excel Spreadsheets with only small configuration changes. The inclusion of Google Charts allows complex information to be presented clearly and concisely while still allowing for the data to be exploded into tables as needed. Taken together this design pattern allows for rapid development and enhancements. The average time it takes to get a new request through the entire SDLC process is usually three to four days.

SECTION 4: SIGNIFICANCE

The primary objective of this application was to allow non-technical management staff to quickly monitor critical aspects of the institutions under their control. Each facility Superintendent sees information directly relevant to his/her own institution. Region Administrators and top-level management see consolidated information for all the institutions in their jurisdiction and can also easily select any single facility within their purview. Prior to the introduction of the Dashboard, managers would need to directly contact their section heads to get status reports or to log in to one or more different applications to get details on a specific case. For example, tracking the status of a correctional officer vacancy required checking three separate systems, including the *State Personnel System*, the *Employee Management System* and the *Applicant Tracking system*. Now this information is readily available on the main screen.

The Dashboard has also added many new functions, such as the ability to run a unified search for a phone number across all the independent systems. This has been extremely useful when contraband cell phones are discovered. Investigators are now able to reverse lookup phone numbers for matches on all visitors, inmates and staff records. Another new feature are the enhanced alerts. Superintendents are notified when inmates have high balances or large financial transactions processed through their trust fund accounts. Also, staff are alerted to possible hunger strikes whenever a restricted inmate refuses five consecutive meals.

The Dashboard was so well received that within six months of the initial release, the Health Services department requested that another Dashboard be developed to focus exclusively on Medical, Dental, and Mental Health issues. This was accomplished within two months using the existing framework and design pattern. This version allows them to monitor metrics that were impossible to attain previously.

As Operations Manager for Triangle Region, I oversee and assist 14 state prison facilities in their day-to-day operations. The Dashboard application is a user friendly tool that provides readily available data in critical areas of prison operation within my fingertips. It allows me to see everything from Custody stats to Medical/Mental Health care to Hiring/Vacancy needs. Since I can also view the information from a region standpoint, I can gain a bird's eye view of all 14 facilities at once, allowing me to gage performance or address areas of concern without interrupting the administrators from their daily routine of managing a prison. It's also a plus when I can refer to one location to retrieve vital correctional information without having to review multiple databases or remember various database commands.

Mary Beth Carroll, Operation Manager

SECTION 5: BENEFITS

This project was developed in order to aid administrators with oversight of their facilities. The original impetus was to provide high level metrics and to identify areas where employees were failing to meet policy. Yet, the project was able to greatly exceed its stated goals, focusing on prevention and trend analysis. In working with the business stakeholders, IT was a strong advocate for designing a proactive launch pad instead of just an auditing report. The data presented does not simply alert users to potential problems but also operates as a work list showing new items and events that are comfortably within expected limits. Moreover, by developing the Dashboard in-house, IT was able to build direct links from the application back to the primary source applications allowing the user to take follow up action. For example, a user can see that there are three inmates who have filed a grievance. The user can click the Dashboard record for the inmate and immediately transfer to the Grievance system and work on the appropriate response. As a result, the Dashboard has expanded its user base from solely administrators to all prison staff. Nurses can track medical notes that need physician signatures, custody staff can quickly see which inmates are due for drug testing and social workers can see which inmates are due for release. The inclusion of charts and graphs have allowed staff to remain focused on improving their performance month after month and also alerts them to subtle changes in the prison environment. Since the technology is extremely flexible and items can be added or modified within a couple of days, the Dashboard has proven to be very responsive to policy changes and requirements. Within the last year the Dashboard has been updated 27 times to address evolving needs including adding Therapeutic Diversion Units, new restrictions on the use of Restrictive Housing, tracking Durable Medical Equipment, and accommodating inmates with ADA needs. Indeed, the Dashboard has been so adaptive that IT has added interfaces to many of its administrative functions into the application. These include Server Monitoring, Cost and Hits, application email monitoring and shows users currently logged into any DPS application. Overall, the Dashboard has helped administrators gain better insight into their facilities without having to request updates from their section heads. Simultaneously, it has helped front line staff with getting a better understanding of areas outside of their primary focus as well as giving them a quick launch into the specific tasks they need to complete each day.

APPENDIX

