Multnomah County

Decision Support System – Justice Review

Current Environment Assessment

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Document Purpose

This document provides a comprehensive assessment of Multnomah County's Decision Support System – Justice (DSS-J) solution.

Version	Date	Description/Changes
1.0	10/30/15	Initial draft version of the report.
2.0	11/30/15	Updated discussion draft with changes from initial county comments.
2.1	12/7/15	Revised version based on updated information.
2.2	12/28/15	Revised version based on additional county comments.
2.3	1/12/16	Revised version to correct a grammatical error.
2.4	3/4/16	Corrected CRIMES interface status.

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I. Executive Summary

I. Executive Summary

Decision Support System – Justice (DSS-J) provides Multnomah County with a cross-jurisdictional and cross-system view of criminal justice information. Designed and implemented in the late 1990s, it is a data warehouse with controlled access and managed tools. It provides the only information repository that bridges the agency silos about criminal justice in Multnomah County, and its unique view across systems provides a critical decision-making tool for operational staff, analysts, executives, and county leadership.

A. Overview

During its 17 years of operation, DSS-J has undergone major revisions, and the criminal justice community has replaced or upgraded most of the source systems that provide data to DSS-J. Unfortunately, as the following paragraphs detail, this tool is suffering from technology datedness and a lack of attention to governance, processes, and design. MTG Management Consultants, LLC's effort provides a systematic review of the DSS-J solution. The paragraphs below highlight the different areas examined in this report.

B. Technology

DSS-J's technology is operational but aging. Data warehousing and analytics technology evolve rapidly, and by using versions that are 10 or more years old, DSS-J is not taking advantage of a decade's worth of improvements in performance, security, and functionality. The data warehouse design, tailored to the state of the criminal justice community at the time of DSS-J's implementation, requires a structural optimization to meet evolving business needs. A more integrated design would better integrate DSS-J's data sources. Data interfaces and the difficulty of adding data limit the value of DSS-J.

C. Data Management

External system changes that limit the availability of source data are adversely affecting DSS-J. Uncoordinated updates to source systems, inconsistent definitions and formats of data elements and reference data, and unclear business rules adversely affect the usability of DSS-J. Implementation of a data management process, executed via an operational steering group, is one potential solution to coordinate partner changes that affect DSS-J.

D. Organization and Resources

While the need for data analysts has increased within stakeholder organizations, the number of data analysts has decreased and shifted some responsibility for this complex discipline to the Information Technology (IT) team. In addition to complex queries, the DSS-J IT team[1]

[1] The two IT staff members assigned to support DSS-J are referred to as the DSS-J IT Team in this report.

faces an increasing workload on desired data sources and user training, in spite of a decreased staff.

DSS-J's policy group has set some policies for access to and use of the system, but no such group exists at the operational level to make decisions about integration, data management, and technical implementation.

E. System Value and Potential

DSS-J provides a unique opportunity to inform criminal justice process operations and policy, but recent advanced reporting needs have highlighted weaknesses in DSS-J's flexibility, data availability, and usability, as well as weaknesses in its operational management framework. Operational and policy needs are outpacing DSS-J's technological capabilities and management practices. In order to realize DSS-J's potential, the Multnomah criminal justice community should implement data management and policy strategies and consider the performance and functional enhancements offered by the latest versions of data warehousing and analysis technologies.

II. Introduction

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This report assesses the current environment of Multnomah County's DSS-J solution. It focuses on how the technological, management, and policy environment positively and negatively affect the system.

A. Project Overview

Multnomah County operates DSS-J in order to inform policy and operational decisions regarding criminal justice. Since 1998, DSS-J has integrated data from across the county's criminal justice enterprise, and it exposes the data to the criminal justice community in the form of standard, custom, and self-service reports. DSS-J has undergone several significant environmental changes in that time, from staffing and budget reductions to uncoordinated changes in most of its critical data sources. Multnomah County hired MTG Management Consultants, LLC, to assess the current implementation of the DSS-J system and the environment in which it operates.

B. Document Methodology

This Current Environment Assessment captures MTG's evaluation of DSS-J's current state based on interviews with the following members of Multnomah County's criminal justice enterprise:

- *Department of Community Justice (DCJ)* – DCJ aids in preventing recurrent crime among citizens who are on trial or convicted.
- *Local Public Safety Coordinating Council (LPSCC)* – LPSCC is responsible for program management and funding of DSS-J.
- *Multnomah County Circuit Court* – The circuit court executes the judicial process and determines alternative justice sentences.
- *Office of the District Attorney (DA)* – The DA uses DSS-J to aid in understanding criminal activity and to inform filing decisions, sentencing recommendations, and victim restitution.
- *Public Defense Forum* – Public defenders use DSS-J to understand the value of diversion programs and the likelihood that a defendant will benefit from particular programs.
- *Multnomah County Sheriff's Office* – The Sheriff's Office uses DSS-J to review sentencing, resident history, and sentencing trends.
- *Department of County Assets (DCA) IT* – The IT team staffs and operates DSS-J and fulfills data analysis requests.

The state of the DSS-J environment will shape recommendations on how to proceed with the system.

C. Document Organization

The remainder of this document contains the sections listed below.

- *Section III – System Value and Potential*. Highlights stakeholders' uses and desired uses for the system to operate and improve the criminal justice process.
- *Section IV – Technology*. Describes DSS-J's current technical infrastructure and the ability to fulfill the criminal justice community needs.
- *Section V – Data Management*. Describes the measures taken to make source data usable for reporting.
- *Section VI – Organization and Resources*. Summarizes DSS-J's organizational alignment and staffing.
- *Section VII – Summary*. Presents a summary of the Current Environment Assessment.

These sections describe DSS-J and highlight current strengths and opportunities for improvement.

III. System Value and Potential

III. System Value and Potential

Stakeholders agree that DSS-J has vast potential to improve understanding of criminal justice process outcomes for the processes' customers: defendants, victims, and incarcerated individuals. Stakeholders envision using detailed, accurate, multiagency data to drive operational and policy effectiveness.

The implementation of the ideas below is subject to their fiscal, analytical, technical, and policy feasibility. Ultimately, it will be up to the DSS-J governance group to assess those factors and determine the extent to which each idea can be implemented.

A. Operations

Stakeholders identified a broad spectrum of operational uses for DSS-J, which fall into one of three feasibility categories:

- Already implemented, and cited here as an example of DSS-J's value.
- Currently feasible.
- Dependent on rectifying existing shortcomings or adding new interfaces.

Some of the current and desired uses, grouped by functional area, include:

- Policing.
  - » Specialty prosecutors on the PLUS team, such as those focused on human trafficking, are studying crime prevalence in hot spots around the city and attempting to identify and address the primary source of the activity. The prosecutors want to know when the Portland Police Bureau (PPB) interacts with or detains certain members of a group to determine whether the activity provides additional understanding or may lead to an arrest. The team has to look up persons of interest now, which usually provides days-old results. The prosecutors would like to subscribe to real-time data.
  - » When members of PPB enter a drug zone to execute warrants, they need to know recent activity in the area for their safety, as well as current sentences and court exclusions to avoid bad arrests.
- Prosecution.
  - » The criminal justice enterprise as a whole could use a robust defendant chronology, for adults and juveniles, which shows the person history as both a victim and a defendant. It would detail contact information, contacts, living situation, gang affiliations, and police contact, including arrests, filings, sentences, probation, holds based on judicial discretion, and misdemeanors.

It may be possible, on a case-by-case basis, to include data such as personal health information (PHI) and even library data in order to support and monitor the success of alternative sentences. For example, if a court sentences a parent to house arrest with the condition of reading daily to the children, the court and probation officer can monitor book checkout.

  - A charge history report would show what cases are going to trial, what charges the DA files, what charges are reduced, how charges are disposed, and what sentences the courts issue.

- Detainment and Incarceration.
  - A time-served report would show concurrent versus serial sentencing, as well as time served pre-trial, written off for good behavior, or waived to clear jails.
  - The monthly jail population report shows pending cases, how long they have been pending, who is prosecuting them, who is defending them, and what their primary charge is. Stakeholders would like to see this as a dashboard.
  - The jail longevity report shows jail capacity, average stay length, and stay length by crime type and aids in optimizing jail operations and predicting capacity.
- Probation and Recidivism.
  - A restitution report would quantify the victim's losses and depict the offender's progress in meeting his or her restitution sentence.
  - A recidivism report would use the state definition of recidivism to portray incident-based recidivism and probation violation.
- Staffing.
  - A recent arrests report would provide information necessary to support staffing forecasts by some criminal justice stakeholders.

While some of these connections or uses may not be implementable, they provide examples of the operational impact that DSS-J can support. In summary, the stakeholders' operational needs require greater access to information and the ability to present it in multiple formats.

B. Policy

The ability to disaggregate and analyze data is vital to understanding local crime and adapting policy. Detailed data allows criminal justice stakeholders to confirm experience-based observations and see the effects of policy changes before they become apparent to observers. However, the number of questions posed now, the complexity of their solutions, and the limited number of data analysts who are fully trained to answer those questions leaves the bulk of work for the IT team, which is understaffed for these types of requests.

- A jail use report would provide means of reducing jail use. This is associated with the MacArthur Foundation Grant.
- A racial and ethnic dashboard would identify anomalous trends or spikes of racial or ethnic contact with police and catch all charges (e.g., interfering with public transit, disorderly conduct), by precinct or day of the week. Stakeholders could analyze this data in terms of special events or other factors.
- A comparative analysis of local versus state jail use would depict the overall impact on criminal justice based on using local jails to comply with House Bill 3194. It would address related questions about the optimal mix of state incarceration versus local incarceration, the amount of state savings recovered by the court, the difference in time required to resolve cases, and the effects on pretrial holds, time served, and use of bench probation.
- An alternative justice outcomes evaluation would address the costs and benefits of nontraditional sentences.
- A crime demographics report would allow analysis of crimes and demographics without including any personal information.
- A recidivism analysis would show recidivism based on sentencing, whether an individual is imprisoned and then put on probation, put directly on probation, or given an alternative sentence.
- A filing trend analysis would show historical trends in cases filed by charge type.
- A public versus private defense comparative evaluation would compare trial, conviction, alternative sentencing, incarceration, and recidivism rates between public and private defenders.

Based on the level of enthusiasm and forward thinking displayed by DSS-J stakeholders, they will likely devise many other potential uses of available data to continue improving criminal justice processes.

IV. Technology

IV. Technology

DSS-J is functional as currently built. However, its data warehouse and user interface have several correctable challenges, primarily with technology and design datedness. The following subsections provide additional analysis.

A. Currency

The DSS-J data warehouse uses a SQL Server database management system that includes a database engine, SQL Server Reporting Services (SSRS), SQL Server Integration Services (SSIS), and SQL Server Analysis Services (SSAS). The database backs up to NetApp storage using snapshot technology.

Together, the dated SSAS cubes, Windows Server, and Impromptu 7 pose the risk of security breaches and operationally costly downtime. They also deprive users of the functional, performance, and usability enhancements made available in the last decade.

1. Database Platform

The SSAS cubes use version SQL Server 2008 r2, which is two major versions older than the latest version, 2014, and is unsupported by the vendor. Using out-of-date software poses a risk to the county in the event of a technology failure, because bringing DSS-J and its data back online would be costly.

2. Web Interface

The DSS-J Web user interface is built with Active Server Pages (ASP) 4.5 and Microsoft .NET, but it includes an ASP 1.0 plug-in that is preventing an upgrade to the Web server operating system. The Web server uses Windows Server 2003, which is two major versions old and is unsupported. Without support, the server does not receive security patches.

3. Business Intelligence Reporting

DSS-J also uses an installed business intelligence (BI) client, Cognos Impromptu 7, which is unsupported. Last updated in 2004, this version is significantly out of date. The DSS-J community has the following needs as related to BI:

- Update the SSAS cubes to the 2014 version to restore vendor support.
- Investigate means of upgrading the Windows Server in spite of the problematic ASP 1.0 component, or redevelop the dated component.
- Update the BI user interface and data visualization technology based on current and anticipated needs.
- Train appropriate users on the tool.

The DSS-J community has an opportunity to align its BI needs with the BI effort underway in the county.

B. User Interface Functionality

This assessment of the DSS-J user interface focused on the business value of its products: standard reports, advanced analytical reports, and self-service reports.

1. Standard Reports

The DSS-J IT team publishes a set of standard reports at varying frequencies via Web and e-mail. The standard reports are simplistic, and the publication frequency is sometimes insufficient to satisfy operational needs. It may be possible to improve the information value and frequency of these reports with sufficient stakeholder input.

2. Advanced Analytical Reports

For non-recurring reports, analysts within the criminal justice community are data mining DSS-J. Some stakeholders need very complex reports that exceed the detail of the standard reports in order to drive operations. Detailed analytical reports are also vital to policy and funding efforts, such as securing and renewing the MacArthur Foundation Grant.

However, multiagency queries are complicated and require that analysts relate agencies' records using undocumented and inconsistent criteria. For example, LPSCC recently assembled a Justice Reinvestment report, at a high level of effort, and simplified the questions to make them feasible to answer.

3. Self-Service (Ad Hoc) Reports

DSS-J's greatest potential is in self-service reporting for ad hoc purposes. Members of the county's criminal justice community are "data hungry" and have a backlog of analysis products they would like to produce on their own schedules. In the Office of the DA, for example, turnover in the last 3 years has resulted in about one-third of the office being attorneys new to the county, who expect to use DSS-J regularly for informing prosecution and sentencing recommendations and for special projects in coordination with the PPB. The expectation that the county will have the capability to mine its information is a growing trend that DSS-J needs to keep pace with as its workforce turns over.

Further, there is no training for stakeholders on how to use the tools, they have access restrictions, and do not clearly understand the data. These obstacles limit DSS-J's potential as a self-service reporting tool. Specific challenges include:

- The BI interface, Impromptu, is dated and requires more technical knowledge than is available among most users, even the data analysts. The users are untrained on it and must learn it through extensive use.
- Data sources use nonspecific table and field names, inhibiting accurate queries.
- Users have access to preformatted modules of data designed to meet predicted user needs, which limits their ability to design their own queries.

Self-service reporting provides greater fulfillment of user reporting needs than the standard reports and, unlike the advanced analytical reports, lightens the analytical burden on the IT team. In combination with near-real-time data, the ability to build complex reports would enable policymakers and analysts to sit together and build reports on the fly. In short, the average agency user with access rights does not use this capability.

Opportunities for Improvement:

- Add dashboard capabilities for visualization of critical data.
- Create a robust and timely Web reporting utility by publishing near-real-time data or by automatically pushing reports to it from the BI platform without human intervention.

C. Data Warehouse Design

DSS-J's functionality is inhibited by the fact that source data is not effectively transformed during ingest and then is stored in silos rather than integrated.

1. Maintainability

DSS-J maintenance is challenged by the complexity of adding new data sources and altering business logic, and by effort spent on unused data.

Data Ingest

Ingesting data from external sources to DSS-J's data warehouse has been challenging. While the DSS-J IT team has limited resources, the bottleneck has been with the solution provider's resources and cooperation. The county is not the contract holder in either case, so the solution provider is not responsive to DSS-J needs, and intervention from the contract agency is often necessary. As a result, establishing communication between DSS-J and recently replaced external sources has taken about 1 year per interface. For example, Regional Justice Information Network (RegJIN), the new PPB record management system (RMS), has not fed into DSS-J for over 1 year. Overall, several key data sources remain disconnected due to uncoordinated upgrades of the source systems, while impending upgrades to other key source systems are likely to create additional barriers to data aggregation. The complex relationship also makes interface testing and verification time consuming and slow. Data verification alone is challenging, as records have to be moved and then verified in each system

by each partner in the interface. Currently, the backlog of desired interfaces (see subsection IV.D) is growing faster than the DSS-J IT team can create, test, and validate them.

Business Logic

The DSS-J data warehouse contains 456 stored procedures and functions. Embedding the business logic in the database with stored procedures, while efficient for the database, does not support long-term maintenance and logic improvements. In addition to currency, maintaining the logic in the database requires skilled technicians that understand the data, database tools, and business logic.

Criminal justice stakeholders have already or will replace almost all key systems in the next 5 years, and the record of restoring connectivity to DSS-J indicates that each upgrade will pose significant additional challenges. These connectivity issues, which result from embedded business logic, decrease the utility of DSS-J by delaying the addition of new sources at the county, state, and national levels and preventing effective data analysis by either analysts or the IT team.

Placing the business logic from these procedures and functions in a middle, business-logic tier would enable easier maintenance and updates.

2. Functionality

DSS-J's functionality is limited by the fact that source data is not effectively transformed during ingest and then is stored in silos rather than integrated.

Transformation

DSS-J does not transform ingested data into defined, community-wide formats using published business rules for stakeholder understanding. Instead, DSS-J ingests the data largely as formatted in source systems. As a result, users must perform transformation on extracted data each time they perform analysis in order to attain data for compilation and comparison. It requires the IT or data analyst teams to take time to reformat data or rectify exception cases, and that labor only affects the extracted data; it does not improve the data resident in DSS-J. In addition, varying transformations of DSS-J's data yield inconsistent reports and reduce trust in the data. Data analysts often follow up on queries with time-consuming manual verification efforts.

Integration

The data warehouse stores data in silos by data sources (e.g., court data, police data, and jail data) despite the fact that there are overlaps in the records, such as person and charge data. In fact, changes in source systems and business practices have changed how some of the data is collected and entered, giving new meaning to existing fields in DSS-J. When built, this

fragmented design reflected trepidation among stakeholders about sharing data. However, the design continues to complicate multiagency queries, as data analysts must re-forge relationships between records and equate differently formatted fields. In addition, due to un-indexed relationships, these complex queries across organizational silos have longer response times and can impair system performance.

Opportunities for Improvement:

- Design a more integrated data warehouse, with broader use of views, which reduces duplicate data elements and establishes record relationships.
- Separate the business logic into its own layer of the solution.
- Simplify the addition of new data sources by adding a data abstraction layer outside of the data warehouse.

D. Scalability

Because the scope of DSS-J's existing data interfaces are insufficient to fulfill typical operations and policy requests, stakeholders in the criminal justice community expressed a need for operational and policy uses for data from a variety of new sources, including:

- eSWIS. There is additional data that stakeholders would like (mug shots, fingerprints, regional crime history, and person information).
- Sentencing data. Currently, court personnel enter this data manually based on court transcripts.
- Oregon Police. This would allow analysis of statewide recidivism.
- Behavioral health data.
- Criminal Justice data.
- Recognizance data.
- Restitution data.
- TimeCalc time served data.
- Oregon Revised Statutes (ORS).
- Formbooks.
- Restitution data.
- Juvenile data.
- Personal health information on a case-by-case basis.
- Library data on a case-by-case basis.
- Historical data prior to 1995.
- Public defender data related to charges and demographics.

In addition, Oregon's Office of Public Defense Services is encouraging interfaces to other systems across the state.

Adding and maintaining these sources would require effort that the DSS-J IT team currently directs toward resolving business logic issues described in subsection IV.C.1, as well as data management issues described in Section V. The addition of these interfaces would also require operational focus on building and retaining relationships with external parties, to ensure that the data is consistently available and accurate.

Opportunities for Improvement:

- Prioritize the list of desired data interfaces by value to the DSS-J community data stakeholders.

V. Data Management

V. Data Management

Data management typically includes data currency, cultivation, governance, transformation, and reconciliation activities performed on data. For DSS-J, infrequent synchronization with source systems inhibits data currency. In addition, minimal data governance increases the amount of effort spent on data transformation and reconciliation. The subsections below provide additional analysis.

A. Data Currency

The data present in DSS-J is often days or weeks old, and this data met and continues to meet the system's legacy requirements for policy analysis. However, the delay in incorporation of new data nullifies the value of such functions as real-time notifications in stakeholders' operational queries. One example of operational application would be notifications of activity for gang-associated persons of interest, but the pace of activity among gang members requires action within hours, not days. DSS-J has existing, functioning interfaces to eSWIS, the jail management system, and the Law Enforcement Data System (LEDS), both of which provide great value to the criminal justice enterprise, but DSS-J receives the data too infrequently. Changes to the frequency must be assessed based on business needs and negotiated with the source system owners.

B. Data Cultivation

The DSS-J data warehouse currently consists of eight databases, with 386 tables, and about 200 SSIS packages. There is no routine method of assessing users' data needs and identifying unnecessary data elements for removal. This is not a reference to data retention for compliance purposes, but a reference to refining the data elements pulled from source systems over time, as business needs change. As a result of uncultivated data pulls, unused data requires ongoing maintenance time. Nor is there routine analysis of data to add from source systems, due to the complexities of the interfaces and business logic.

Opportunities for Improvement:

- Collaborate with source systems to increase the frequency of data import to DSS-J.
- Identify a means of ongoing refinement of data ingests to remove unnecessary data elements and reduce long-term maintenance and storage needs.

C. Data Governance

Stakeholders could not cite examples of DSS-J data governance, in the sense of defining enterprise-wide master data objects, their attributes and attribute values, their quality standards, and business rules that describe how the objects relate. The intent of defining master data types is to allow enterprise-wide data exchange, aggregation, and comparison without requiring data re-formatting or subjective interpretation. Within the criminal justice

community, master data objects would include defendants, victims, incidents, crimes, charges, and sentences, among others.

Without effective system and data governance, many source systems have become unavailable to DSS-J in the last 2 years after source systems' upgrades led to new, undocumented data formats. For example:

- DSS-J has not reestablished an interface to the PPB's RMS, RegJIN, since it transitioned to Versadex by VersaTerm. DSS-J's IT team has been working to map the data but is struggling to automate the process.
- The State Court's case management system was disconnected almost 18 months ago. The DSS-J IT team expects to reconnect it soon, after a significant investment of effort.

For each altered and undocumented interface, DSS-J's IT team must reinterpret the data and re-create the business logic to ingest the data. Upgrades to criminal justice systems that exist within the county can be coordinated to ensure that new systems use common data definitions and data quality standards. However, a means is also required to coordinate changes to source systems that exist outside the county. To date, source system owners have not prioritized such coordination, due to other higher priorities and a lack of resources in their organizations.

1. Common Data Definitions

Without shared definitions and business rules, stakeholders are speaking different languages. Among the major data elements, such as incidents, people, vehicles, cases, and charges, there were several examples of terminology differences among the stakeholders' source systems, as described below.

- *Arrest Date* – The court uses the date of a defendant's sentencing, while the PPB uses the date of a defendant's incarceration.
- *Charge Codes* – The courts and PPB use the same charging codes as the DA's Office, but the DA's Office appends certain signifiers in special cases. For example, they sometimes add "-A1" for pleadings that involve firearms. Those modified charges populate to DSS-J.
- *Charge Descriptions* – Some source systems are using the latest descriptions, but others are using dated descriptions. Source systems may or may not apply date ranges to charges.
- *Charge Category* – Systems differ in listing charges as misdemeanors and felonies.
- *Sexual Orientation* – Some systems use only male and female, while other systems use choices across a spectrum.

- *Laws* – Some systems use updated lists while others were last updated 10 years ago.
- *Primary Charge* – PPB has additional nuances not present in DSS-J, which created confusion for the Department of Community Justice (DCJ).
- *Court Case Number* – The courts update cases repeatedly, with each update forwarded to DSS-J. However, the jail adds a suffix in eSWIS when charges are added to a case (e.g., X, Y, and Z) and those modifications are forwarded to DSS-J. Since it is rare for a single person to have a single charge, count, and disposition, this system results is multiplicity of records.

This situation deters multiagency queries, as shown by the examples below:

- The LPSCC "Waterfalls" Report took 6 months to create due to differing definitions.
- The Justice Reinvestment Report highlighted differences in data definitions, including outcome classification. Drilling into the outcomes In Jail, On Hold, Pre-Trial, and Post-Trial resulted in dually counted results because of gray areas where the outcome definitions had crossover. It took a significant level of effort to ensure that individuals were counted only once, and the IT team had the responsibility of choosing which category an individual fell into "more."

The lack of data definition, and accompanying documentation, results in repetitive requests of the DSS-J IT team to explain what the data is or what it means. Documented and commonly accessible data definitions would improve the quality of queries, reduce dependence on the IT team, and save users' time.

2. Common Business Rules

Beyond the definitions of data objects, the source systems apply business rules differently to make decisions or calculate metrics:

- *Crime Severity* – ORS has different crime severities, but there is no consensus on how to categorize them. DSS-J and DCJ categorize differently.
- *Primary Charge* – There is no consistent method to determine the primary charge.
- *Outcome Success* – There are no definitions of success for general categories of defendants. For example, success for a medically noncompliant mental health patient may be consistently taking prescribed medications.
- *Recidivism* – The DA's Office is now using the statutory definition for recidivism, introduced in HB 3194, which is also the most common definition in use across the country. This definition was not common knowledge.

By using different rules for calculation, organizations produce differing metrics that create confusion and result in distrust of DSS-J.

3. Data Governance

Without defined community data elements, data governance is not occurring. Data governance would ensure that data providers enter data into source systems using the standardized enterprise definitions and that data quality checks occur to correct issues before the data exchanges with other systems occur. Some source systems are applying rigorous data integrity checks, whereas others allow unchecked input. One cited example was a record that had a sentencing date in 2015 but a trial date in 2004.

Opportunities for Improvement:

- Define master data elements, their attributes, and their attribute values to disambiguate similarly named data and enable data aggregation and exchange. The most common solutions is an enterprise data dictionary, and one of the most important data elements for the criminal justice community to define would be events, because they affect the event-based workflows and data exchanges.
- Define business rules that govern data element relationships, as well as calculations such as primary charge or recidivism.
- Introduce data governance among criminal justice systems to ensure data quality and reduce transformation required between systems and after DSS-J extraction.

D. Data Transformation and Reconciliation

The lack of data governance complicates routine activities related to data transformation and reconciliation.

During data transformation, the DSS-J IT team must convert imported data into formats suitable for the DSS-J database. The effort required for data transformation correlates inversely with the effort invested in data governance. Because data element definitions differ greatly between criminal justice systems, the business logic to achieve effective transformation is complex and has little resilience to changes in the source system.

During data reconciliation, the data warehouse's business logic matches records using unique identifier(s) and merges them in accordance with business rules that determine authoritative sources and conditional rules. Reconciliation is especially important in event-based systems such as DSS-J because a data element's authoritative source may change based on the event.

The following subsections provide analysis of data transformation and governance of county source systems, other source systems, and data extracted from DSS-J.

1. Ingest From County Controlled Source Systems

With criminal justice data entering DSS-J from about nine systems, each with duplicated and unique data, the DSS-J IT team must ensure that records merge correctly. Person matching is the most problematic reconciliation, and although it requires final decisions by humans, the system could better facilitate record merging. There are similar problems merging charges with different names, social security numbers, birth dates, and more. DSS-J displays a primary name, but not a primary social security number or birth date. Stakeholders should be able to see all charges associated with a person.

2. Ingest From Other Source Systems

The county can assure quality of its own source systems, thereby reducing transformation and reconciliation complexity, but it has little control of external sources and, in many cases, does not have points of contact for the sources. Many input organizations are not currently using DSS-J and are therefore unmotivated to use their resources to ensure data quality. As a result, some DSS-J data transformation is unavoidably effort intensive, such as tying in data manually and merging records.

3. Transformation of Extracted Data

Despite data transformation effort aimed at successfully ingesting source system data, data extracted from DSS-J often requires significant additional transformation and tallying to become usable. The data contains slight variations that prevent accurate aggregation. For example, some records included a null value rather than the expected blank, which threw off result counts. Any effort invested in data transformation after extracting data from DSS-J is essentially wasted labor, since it yields no lasting improvement to the quality of DSS-J content.

Opportunities for Improvement:

- With technology facilitation and a human review, actively merge records.
- Establish data quality standards with user input and perform additional ingest transformation.

VI. Organization and Resources

VI. Organization and Resources

Organization and resource factors, including staffing, budget, access to data and services, and alignment, determine how functional and available DSS-J is for stakeholders. The subsections below provide detailed analysis of each factor.

A. Staffing

Staff levels and types have changed greatly since DSS-J's implementation. The subsections below provide details for each type of support staff.

1. Information Technology

The workload on the IT team has increased over the last 2 years due to a number of factors, including:

- Source systems have changed, requiring extensive changes to the data extraction, transformation, and loading (ETL) processes.
- There are more teams requesting data analysis, and those teams require support from the IT team to build complex queries.
- Some agencies, such as the courts, no longer have an embedded analyst and must request direct support from IT for day-to-day reporting.

While analysts could assume quite a bit of responsibility for reporting, high turnover among the analysts in recent years has moved the burden of executing many reports back to the IT team, along with the need to teach new analysts the available data.

2. Data Analysis

Beyond self-service reporting, the area that presents the greatest opportunity to the Multnomah County criminal justice enterprise is stable and mature data analysis capability (sometimes referred to as business analysis by stakeholders). Unlike IT personnel, data analysts are unconcerned with technology and instead focus on complex sets of data to answer questions and identify trends. Each county agency that uses DSS-J had a dedicated data analyst, funded by the agency in which they worked. However, data analysis staffing within the county now is less robust and mature. One organization, the State Courts, does not have the position staffed. Other agencies have rotated the position frequently, in some cases multiples times in a year, or made temporary funding commitments to fill the role. Such frequent turnover, without effective training on DSS-J, has resulted in an increased burden on the IT team to perform analytical functions for which they are not staffed.

In addition to frequent turnover and gaps in data analysis staffing, data analysts face significant data obstacles alone. Data analysts currently spend much more time than necessary collecting and transforming data, but improving the quality and scope of the data in DSS-J would allow data analysts to put their advanced skills to use more efficiently. In

addition, the data analysts work alone for the most part, and do not have resources to aid them in understanding the source data. Encouraging collaboration between analysts at different agencies would aid them in overcoming data challenges and answering complex questions by sharing data expertise and perspectives.

3. Business Analysis

One capability not present in the county's existing staff was a true business analysis capability within the DSS-J support team.[2] Where data analysts are concerned with analyzing the data output of information systems, business analysts shape an information system by learning how an enterprise operates and applying its processes, business rules, and standards to the system. In the case of DSS-J, a business analyst would model criminal justice data flows, depict interactive processes among stakeholders, define criminal justice business rules, and identify source system data exchange formats. This capability would address many of the data management challenges described above, prevent some of the interface breakdowns caused by uncoordinated system upgrades, and enhance the potential of the data analysts.

Opportunities for Improvement:

- Find a way to distribute data analysis tasks back to data analysts and off the IT team.
- Establish a means of training data analysts more rapidly and consistently.
- Transform the data effectively one time so that data analysts do not use time inefficiently making repetitive transformations to the same data sets.
- Consider a business analysis capability to apply the stakeholder organizations' business processes to DSS-J and to create a robust data management approach.

B. Budget

DSS-J's budget dropped from $2,000,000 to $750,000 in the last several years, which primarily pays for a minimal level of IT staffing. Agencies that use and contribute data to DSS-J have no financial stake in the system. As the workload shifts from data analysts paid for by their stakeholder organizations to the DSS-J IT team, one would expect funding to shift to the DSS-J IT team as well. Without a system governance structure, this funding misalignment has continued.

Opportunities for Improvement:

- Assess the adequacy of DSS-J IT funding, as well as methods of sharing the financial stake in DSS-J among stakeholder organizations.

C. Community-Wide Access

LPSCC has not captured or publicized policies regarding DSS-J access, and as a result, past decisions sometimes created confusion.

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[2] The business analyst should reside in the same organization housing the DSS-J program.

1. User Access

Community stakeholder access to DSS-J requires up to eight approvals and a significant amount of time. In addition, LPSCC has denied some access requests without explanation, which can result in confusion and alienation. Stakeholders who are denied access are unlikely to willingly contribute data or otherwise support DSS-J.

2. Data Access

Data access is restricted within the system out of concern for misinterpretation, due to the state of data management in the warehouse. However, because each organization has cause to worry about inadvertent release of its data, each organization is reliant on mutual respect of data release policies.

Beyond differences in access among basic users, some analysts have had broad access, while others have had limited access. Analysts are the most familiar with the available data and therefore least likely to make mistakes in interpretation. Access restrictions decrease their ability to provide value.

3. Service Access

Requests for DSS-J data analysis services have increased as data analyst staffing decreased, yet the strategy for addressing requests for data analysis is unclear. Users use DSS-J to fulfill some requests, but not others, without explanation and without a community discussion to ensure accuracy of prioritization.[3] The DSS-J IT team and data analysts, who are most familiar with the data, are best equipped to determine the level of effort and yet are rarely included in this process.

Opportunities for Improvement:

- Create a clear policy for user access in order to avoid nonproductive efforts by requestors and approvers, and to engender trust and collaboration among DSS-J's stakeholders.
- Identify a policy for access within the criminal justice community. If necessary, implement a peer review process for multiagency queries to ensure correct interpretation. In addition, offer a workaround for those denied access, such as a request submission and vetting process.

D. Leadership

LPSCC envisions DSS-J being a one-stop shop for agencies performing data analysis—much like the vision in 1998 when DSS-J was proposed and implemented—but the mission and strategic goals to achieve the vision are unclear. In order to proceed, several programmatic

[3] One of the essential business conventions among data analysts is that when data from outside their agency is used, they will discuss it with the source agency to ensure that it is correctly represented.

decisions are required, including whether to add juvenile data, how to approach user access, and how to integrate the long list of desired interfaces.

LPSCC already runs a DSS-J policy group that can steer DSS-J policy, including:

- Facilitating user access, data request screening and prioritization, and data sharing.
- Monitoring changes to the state and federal justice environment.
- Providing a marketing plan for DSS-J, both locally and externally.
- Coordinating source system upgrades throughout the county proactively to prevent future interface breakdowns.

While LPSCC's role as a nexus for criminal and community justice leadership and activity within the county is an excellent basis for policy oversight, LPSCC does not have the technical background, resources, or operational authority to manage the day-to-day DSS-J program operations.

DSS-J is missing true operational management. There is no person or group with authority and capability to oversee the day-to-day operational direction of DSS-J. Operational decisions must address issues such as technical upgrades and platforms, management of data interface methods and challenges, and implementation of data management practices. Operational decisions must factor in overarching guidance from LPSCC and technical and functional inputs from IT and analysis personnel.

Opportunities for Improvement:

- Develop a means of managing operational issues, such as technology and data evolution and resolution of data requests. These decisions are more closely related to technology and data management than to policy and funding.
- Create a clear policy on how data requests for non-users (denied users or external parties) are prioritized, including:
  - How to validate requests as appropriate, likely by the DSS-J policy team.
  - How to determine that requests are feasible and what level of effort they require, likely by data analysts.
  - How to prioritize requests.

VII. Summary

VII. Summary

DSS-J is the keystone of multiagency data analysis and decision-making for the Multnomah County criminal justice community. Stakeholders continue to use it to inform criminal justice operations and policy and are inspired to find additional uses for it. DSS-J is using effective technology and meeting the legacy criminal justice community needs. However, stakeholder expectations have risen since DSS-J was built. Recent advanced reporting needs have highlighted weaknesses in DSS-J's flexibility, data availability, and usability, as well as weaknesses in its operational management framework.

DSS-J's technology is operational but aging. The database server, web server, and data analysis tool are unsupported and out of date. By using versions that are 10 or more years old, DSS-J is not taking advantage of a decade's worth of performance and functionality improvements. However, before upgrading any tools, the DSS-J users must determine their current and anticipated requirements.

The data warehouse design, tailored to the state of the criminal justice community at the time of DSS-J's implementation, requires a structural optimization to meet evolving business needs. During its 17 years of operation, the community has replaced or upgraded most of the source systems that provide data to DSS-J, and a more integrated warehouse design with a business logic layer would better incorporate source system changes and better integrate DSS-J's data for analysis.

Beyond the system's technology, DSS-J lacks data management. DSS-J would benefit from stronger collaboration with external sources, which is constrained by external willingness to do so. However, the system can also implement internal data management practices, such as data definition, data governance, optimized and documented transformation, and improved reconciliation, that would improve system usability.

The DSS-J stakeholder community and funding allocations have shifted out of alignment over the years as the IT team has taken more responsibility for advanced analytics. However, the analysts struggle to assume their responsibilities due to lack of BI tool expertise and lack of resources to understand the DSS-J data warehouse.

The governance for DSS-J currently focuses on policy decision making. However, there is a need for operational governance to address technology challenges, data management, funding requests, and similar issues.

MTG will consider the findings documented in this deliverable and provide a comprehensive set of recommendations in the follow-on deliverable, the Implementation Road Map. The objective of that document will be to prioritize the recommendations into short-term and long-term recommendations and to provide the impact and dependencies of each.