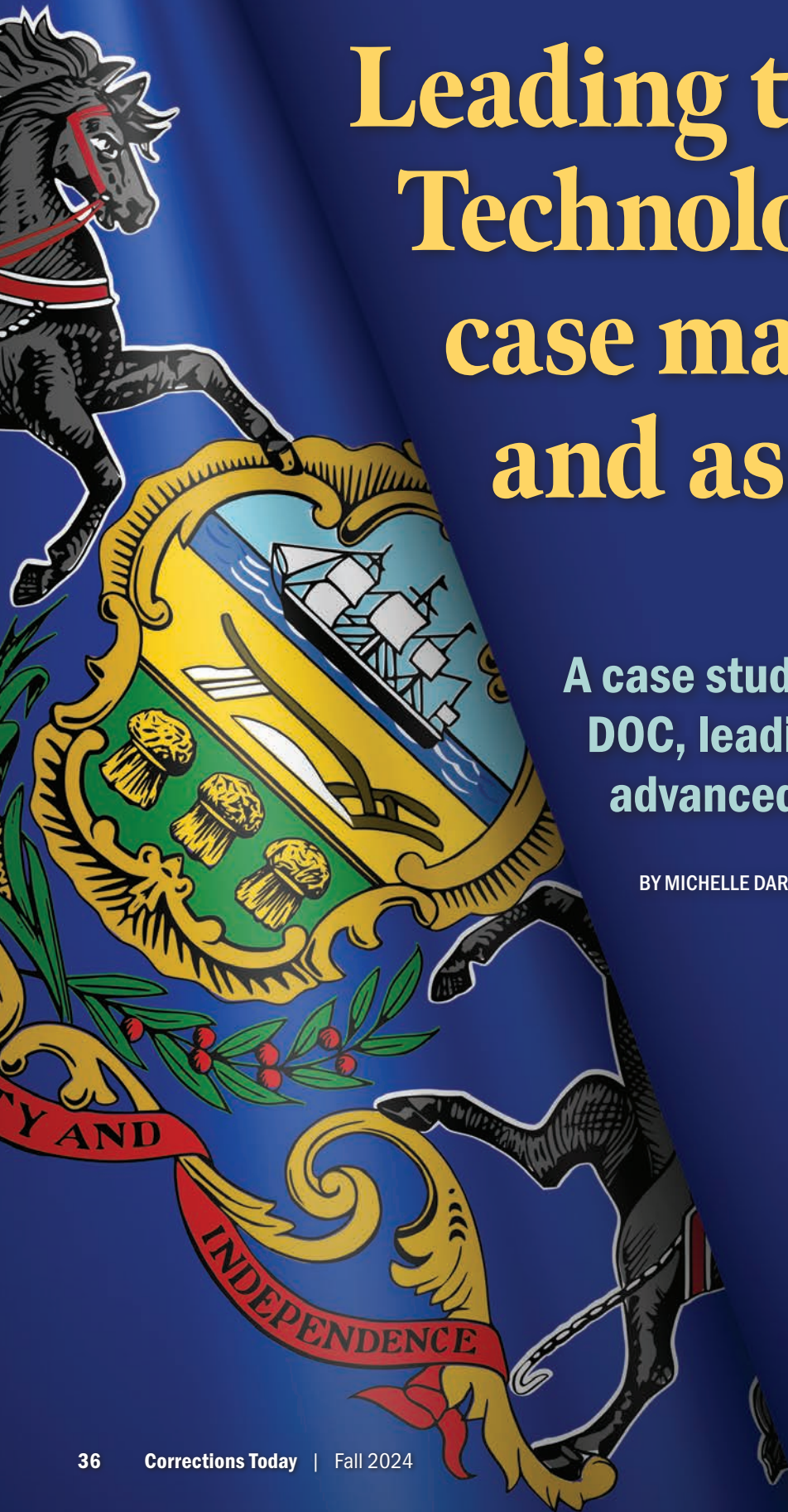# Leading the way: Technology-driven case management and assessment

A case study with Pennsylvania DOC, leading the nation in advanced correctional care

BY MICHELLE DARLING AND JASON STAUFFER

Risk and needs, redefined

Risk and Needs Assessments (RNA) have long been the standard for correctional systems seeking to increase public safety through rehabilitation. Beyond offering standardized methods for categorizing offenders (such as assigning level of supervision), they support tailored interventions that address the specific risks and needs of individuals, improving rehabilitation outcomes, reducing recidivism, and increasing public safety. These tools, when used appropriately, promote the efficient allocation of resources, ensuring that interventions are both effective and equitable. In order for this near-ubiquitous standard to function optimally, agencies must meet certain criteria. This article aims to demonstrate innovative technology developed in partnership with the Pennsylvania Department of Corrections used to design, test, and deploy an advanced risk-needs assessment tool and programming platform that enhances and ensures equity in assessments and case management decision-making throughout the continuum of correctional care, while meeting and surpassing current standards of RNA and classification tools.

In 2021, Dr. Bret Bucklen, Director of Planning, Research, and Statistics for the Pennsylvania Department of Corrections, co-authored a compelling article with a team of researchers titled "Redesigning Risk and Needs Assessment in Corrections." This forward-thinking piece proposed four essential facets that must be integral to the evolving design of risk-needs assessments (RNA): fairness, efficiency, effectiveness, and improved communication.

Dr. Bucklen and his team emphasized the importance of fairness, stating that "RNA tools should be used to yield more equitable outcomes" and must address and overcome potential sources of bias. Efficiency is also crucial, as the researchers found that "RNA instruments are more reliable when they are more automated." Effectiveness is another key aspect. Advances in statistics, data science, and predictive analytics offer new options for RNA tools, enabling them to make better predictions. Importantly, these tools must be customized to the specific population they serve. Finally, the team highlights the necessity of improved communication. They stress the need for training correctional staff to explain risks and needs clearly and translate them into actionable case plans with well-defined sanctions and incentives.[1]

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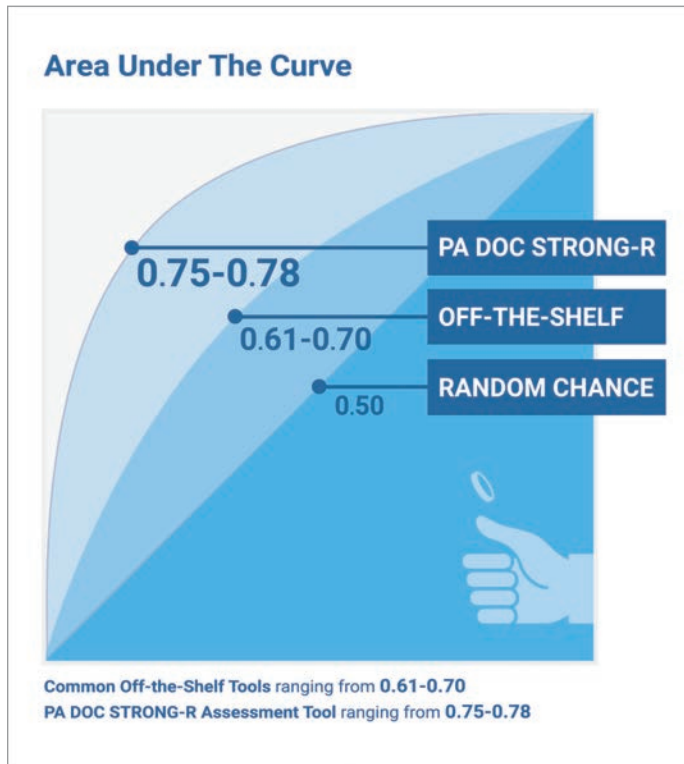
These logical, even obvious, tenets have been echoed across academic journals and are supported by white papers and guidance articles, but most systems continue to struggle with their application. Hundreds of jurisdictions still rely on inefficient and time-consuming paper processes and outdated

tools which are largely expected to over or under classify individuals leading to racial and gender biases, which impacts equity, fairness and perceptions of fairness, and ultimately undermines system effectiveness.

Off-the-shelf, off the mark

The strength of a tool's predictive accuracy is based on a measure known as Area Under the Curve (AUC) where .50 is as accurate as a coin flip, .50-.55 is generally considered 'negligible', .56-.63 is considered 'weak', 0.64-.70 is considered 'moderate, and .71 and above is generally considered to be a 'strong' level of predictive accuracy. When RNA tools are created for a specific population or jurisdiction, they may perform in the moderate to strong range. However, when they are later applied to a different jurisdiction, population, or point in the justice system, their predictive accuracy often diminishes (i.e., when validated, their AUCs are much smaller

Figure 1

Area Under The Curve

0.75-0.78 — PA DOC STRONG-R
0.61-0.70 — OFF-THE-SHELF
0.50 — RANDOM CHANCE

Common Off-the-Shelf Tools ranging from **0.61-0.70**
PA DOC STRONG-R Assessment Tool ranging from **0.75-0.78**

This graphic indicates improved recidivism prediction for the PA DOC STRONG-R vs. commonly used Off-the-shelf tools.

than when applied with the development population). As signified by key researchers in the field, this phenomenon is referred to as 'prediction shrinkage'.[2]
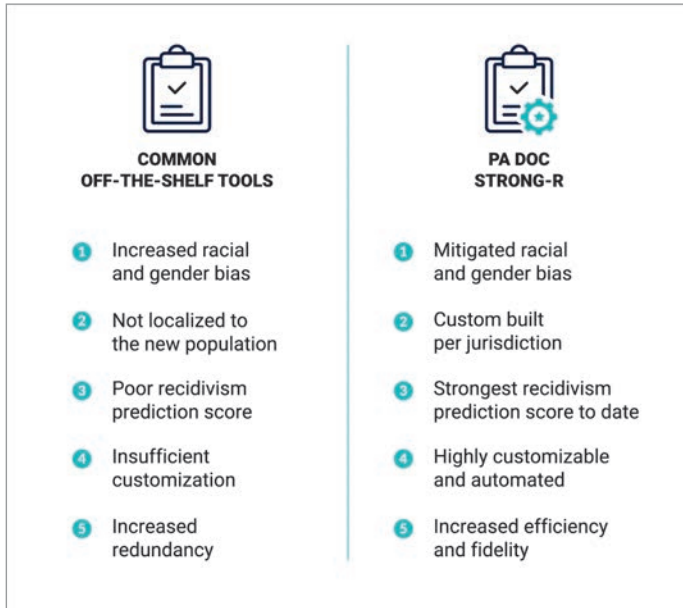
More than simply posing predictive inaccuracies, numerous other problems can also occur when applying an existing tool to another jurisdiction. One major concern is bias, both racial and gender. Many folks in the correctional realm have found refuge in relying upon key anecdotes when responding to concerns of bias: "It's better than not using an assessment", or "No assessment is without bias", or "The assessment is equivalently predictive for all races". While generally true, these statements give little credence to the larger concern that the lower the accuracy and the greater the bias, the more likely an assessment is to contribute to the societal issue of increasing minority contact with the criminal justice system. This creates more opportunity for arrest and conviction, which then unequally contributes to producing higher risk scores and the perceived need for deeper-end interventions for individuals that may not actually be at greater risk to recidivate.

Achieving higher predictive scores, more accurate risk assessment results, and equitable results can be complex, difficult to measure, and require courage to examine transparently. Implementing the right technology simplifies the process by providing an advanced solution that drives the key processes and provides accuracy, data, and quality assurance. This kind of technology takes time and resources, but the endgame isn't to simply apply assessment tools or management systems and then move on. The goal is to improve the safety of justice-involved people, agency staff, and the community. Perhaps it is these high standards and steadfast pursuit of improvement that led the Pennsylvania Department of Corrections to collaborate with Vant4ge.

Care never concludes

To develop a highly predictive, customized, and responsive assessment tool that performs optimally for a jurisdiction and transforms the results from mere information to actionable data for use in case management and planning takes commitment from leadership. It also requires the expertise from a partner that is dedicated to seeing justice for everyone involved in the criminal

Figure 2

COMMON OFF-THE-SHELF TOOLS	PA DOC STRONG-R
1. Increased racial and gender bias	1. Mitigated racial and gender bias
2. Not localized to the new population	2. Custom built per jurisdiction
3. Poor recidivism prediction score	3. Strongest recidivism prediction score to date
4. Insufficient customization	4. Highly customizable and automated
5. Increased redundancy	5. Increased efficiency and fidelity

Notable improvements made in PA DOC after implementing the STRONG-R assessment tool.

justice system. Pennsylvania's Department of Corrections showed exceptional leadership and a commendable commitment to self-evaluation and self-correction.

The first aspect of the partnership's work was the development of an assessment tool that not only delivered more predictive accuracy for Pennsylvania's population but also addressed more contemporary critical issues. Recognizing the importance of tackling racial bias in assessments, Vant4ge and PA DOC were committed to setting a new standard. Vant4ge paired up with Dr. Zachary K. Hamilton and Dr. Alex Kigerl from the University of Nebraska Omaha, and a Steering Committee of cross functional personnel from PA DOC, to create the first assessment tool — reaching far beyond contemporary fourth-generation tools — specifically designed to reduce racial bias.[3] While other tools have attempted to address this issue, none have matched the groundbreaking progress Vant4ge and PA DOC have made in this area. The result is the Pennsylvania Static Risk and Offender Needs Guide-Revised (PA STRONG-R), a modern, customized, state-of-the-art assessment tool. Not only is it the first tool to demonstrate mitigation of bias, but the development version has 'strong' AUC scores that range between 0.75-0.78 (depending on the particular model being evaluated).

In order to develop such a ground-breaking RNA tool, the team produced no fewer than 383 separate versions, all with metrics evaluating predictive accuracy and potential for bias. One of the most significant issues that was tested was whether or not it was more effective to utilize convictions or arrests as either predictors or outcomes. Ultimately, it was determined that convictions performed with more predictive accuracy and less bias. While this required a heavier lift on the part of the Agency to create a sustainable team of personnel to review and validate criminal histories for each and every reentrant in the PA DOC system, the Agency courageously embraced the challenge in the spirit of creating the most accurate and equitable system they could.

> **"In order to develop such a ground-breaking RNA tool, the team produced no fewer than 383 separate versions, all with metrics evaluating predictive accuracy and potential for bias."**

In addition to the issue of arrests vs. convictions, there were a number of other items where specific modifications to predictors improved performance or reduced bias. One of these was the combination of felonies and misdemeanors in assessment items. Instead of focusing on the level of crime, the team focused on the types of crimes committed. Additionally, and as a result of variations in historical data related to previous domestic violence crimes, the team tested and chose to use a simple flag (i.e., did the reentrant have any previous domestic violence conviction?). These and other small changes were suggested by the cross-functional team of subject matter experts, examined and tested in the data, and then ultimately contributed to increased predictive accuracy and fairness in the creation of the assessment tool.

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Strong predictive accuracy and reliable assessment results are essential, but meaningless if the results aren't used to inform the multitude of decisions made throughout the rehabilitative lifecycle. This is where a custom-configured platform, designed to leverage information for decision support, is critical. The PA STRONG-R is powered by the platform, Vant4gePoint, where staff at any level, from frontline workers to directors, can engage with any and all rehabilitative processes. The platform is integrated with the Department's system of record, allowing data to be passed between the systems, as needed. This includes sentencing and arrest data from other Pennsylvania justice agencies, thus facilitating much of the auto-population of assessment items. Vant4gePoint's powerful technology becomes an important aspect because it supports intelligent process automations that reduce redundancy and eliminate inconsistent information throughout the myriad rehabilitative processes and subprocesses.

Figure 3

PA DOC and Vant4ge advancing technologies throughout the continuum of care.

As was clear from Dr. Bucklen, communication is one of the core tenets of institutional supervision. In that, PA DOC chose to employ the highest number of automated messages and system notifications than any other jurisdiction, providing updates in real time, improving case collaboration throughout the agency. What is more timesaving and beneficial for the staff is that these alerts are generated as progress notes. This has the potential to decrease the need for PA staff to enter case notes as they continue to leverage this technology within their other existing systems.

Pennsylvania also worked with Vant4ge to develop a sophisticated method to recommend rehabilitative programming upon assessment completion. At the completion of each assessment, the system checks the subject's eligibility by running through criteria such as risk, level of need in various domains and numerous agency policies to make programming recommendations. Previously, staff were relegated to determining programming assignments by applying paper matrices and considering said policies. This approach required continuous evaluation during internal audits due to its propensity for human error. Moving forward, this will no longer need to be audited, since programs that are recommended must be assigned unless staff purposefully act to remove the recommendation. Whenever they remove a system-recommendation, a review by Central Office staff is automatically triggered. Accordingly, it is no longer possible for line staff to make errors in program assignments.

The results of these new technologies, tools, and program advancements have tremendous potential. Implementation of such a comprehensive tool that impacts so many areas of agency practice continue to be a work in progress and will likely be so for years to come. The promises of increased accuracy, reduced bias, and improved consistency in programming assignments validate such efforts. In addition to the aforementioned advances, PA DOC is also to leverage data through Vant4gePoint's built-in business intelligence dashboard and a variety of customized reports. This allows them to engage in quality assurance monitoring and manage a multitude of practices according to data.

Figure 4: Vant4gePoint Care Management Process

From Conviction to Program Matching, Vant4gePoint provides Decision Support for case management, rehabilitation recommendations, and quality assurance.

Moving the yardstick

The collaboration between PA DOC, Vant4ge, and researchers from the University of Nebraska Omaha has been crucial in advancing correctional assessments by addressing racial bias and utilizing technology to enhance case planning, program matching, and data reliability. Assessment methodologies have significantly evolved over the years, moving from gut-based judgments to static assessments, and then to a combination of static and dynamic evaluations. To fully realize the promise of assessments in addressing the needs of justice-involved individuals and increasing public safety, these tools must perform optimally across all demographics. Those assessment results must then be integrated into comprehensive case plans and inform tailored programming. Pennsylvania's implementation of Vant4gePoint has used technology to create a more responsive and reliable system for case management and correctional practices. By leveraging key pieces of information, the platform not only enhances the precision of risk-needs assessments but also streamlines case management, providing seamless supervision. This partnership sets a new benchmark for the industry, demonstrating how technology can drive significant improvements in correctional care and management. It demonstrates how innovative solutions can lead to more equitable and effective outcomes in the correctional system, while also highlighting the need to continue pushing for incremental improvements to measures of fairness, efficiency, effectiveness, and improved communication to ensure truly fair and impactful results. **CT**

ENDNOTES

[1] National Institute of Justice, "Redesigning Risk and Need Assessment in Corrections," July 19, 2021, nij.ojp.gov: https://nij.ojp.gov/topics/articles/redesigning-risk-and-need-assessment-corrections

[2] Hamilton, Z., Kierl, A., Allen, B., Ursino, J., & Krushas, A. (n.d.). Never Going to Let You Down: Preventing Predictive Shrinkage via the STRONG-R Assessment Method. Justice Quarterly.

[3] First Generation: professional judgement ("gut instinct"); Second Generation: use of static items only; Third Generation: combination of static and dynamic items; Fourth Generation: builds on responsivity factors and drives case planning.

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