A New Data Systems Approach for Drug and Treatment Courts

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The data demands for drug and treatment courts are complex and extensive. New database technology and cloud services provide an advantageous approach for courts and statisticians to consider.

A Brief History

Adult drug courts are the most prevalent problem-solving court type, with an estimated 3,400 adult drug courts nationwide (National Institute of Justice, 2014). Drug courts came into existence in the 1980s because of widespread dissatisfaction with the impact of traditional criminal justice interventions on offender substance abuse and recidivism (see, e.g., Marlowe, DeMatteo, and Festinger, 2003). Around the same time, the concept of therapeutic jurisprudence expanded the role of the court. According to therapeutic jurisprudence, courts could be change agents and have a positive impact on an individual (Lurigio, 2008). This paradigm shift presented an opportunity for courts to apply a new approach to address substance use and abuse, and with that, the first drug court was started in Miami in 1989. Its goal was rehabilitative in nature, focusing on treatment and connections to the community to support sobriety and stability.

Many studies have documented poor outcomes for drug users who experience the traditional responses of the justice system. Marlowe, DeMatteo, and Festinger (2003) point out the ineffectiveness of imprisonment, noting that some studies report that over 95 percent of drug-abusing offenders returned to drug use within three years of their release from prison, with most relapsing within only one year. Further, nationally, 77 percent of drug offenders are rearrested for a new crime, and 44 percent are reincarcerated within five years of release from prison (Durose, Cooper, and Snyder, 2014).

Probation has also been ineffective with this population. Spohn and Holleran's (2002) study in Jackson County (Kansas City), Missouri found that the probability of recidivism for drug offenders sentenced to prison was 82 percent, while it was 43 percent for those sentenced to probation. For drug-involved offenders, the probabilities were 62 percent and 48 percent, respectively. While drug offenders sentenced to probation outperform those sent to prison, they still recidivated at a higher rate than non-drug offenders sentenced to probation (40 percent).

Drug courts provide an opportunity for courts to address criminal behavior while simultaneously focusing on treatment and support, rather than solely imprisonment and supervision. The first drug court opened the doors for the problem-solving court model to be applied to other social issues, such as veterans court, mental health court, and human-trafficking court. Although local practices vary, treatment courts are typically distinguished by several features, such as a multidisciplinary team, intensive supervision, outpatient treatment, application of incentives and sanctions, and connection to supportive services. These features require the exchange of information between team members, other agencies, and service providers for both case management purposes and the evaluation of programs.

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The Complexity and Data Problem

The team approach, central to treatment courts' success, requires that participants have relationships with team members and other professionals: case managers, treatment providers, attorneys, program coordinators, and support systems.

In addition to these connections, drug courts need to track a wide range of information to monitor individual progress and program success, such as attendance at hearings and treatment, drug-testing dates and results, incentives and sanctions, and progress on individualized goals. When current and historic interactions with law enforcement and social services are added to the mix, a spaghetti bowl of entanglements is created that a traditional database approach cannot accurately reflect. New technology is needed to accurately capture and report all of the complexity.

Looking to New Technologies

Currently, many treatment courts continue to rely on an old computer information system developed in the early 2000s that runs on individual personal computers (PCs). In contrast, today we have ubiquitous Internet, tablets, smart phones, and, more important for this discussion, low-cost cloud services that provide a complete system infrastructure. These new technologies overcome the limitations of the old PC-based systems, such as the ability to securely share and efficiently update a person's treatment, progress, and ongoing relationship data, and do so in a low-cost way.

A low-cost solution is important since treatment courts rightly focus their financial resources on treatment services. As a result, IT spending is not normally available for technical design, programming, and support. And when there is IT spending, it is focused on the data needed for program evaluation to support ongoing funding of the programs. Therefore, cloud, open-source, and shared services are the strategies that the treatment courts need to employ to lower costs. While there are many examples of such strategies on the market, one in particular has the capability to be a game changer for treatment courts.

The NoSQL solution

We believe that a new technology, the NoSQL database, is a promising solution for treatment court professionals. Specifically, we use the MongoDB open-source database software at NCSC. The term NoSQL (not only SQL/ non-relational) was first used in 2009 to "describe non-relational databases" that are structurally very different than the tables and rows we use in relational databases such as MySQL, Oracle, and Microsoft SQL, for example. NoSQL databases not only can handle relational data, but also do more.

Instead of tables like one finds in a spreadsheet, the basic units of NoSQL/MongoDB are officially called documents. For our purposes, we think that the term "card" works better, as documents have a very specific meaning and use in justice systems. There can be "cards" in NoSQL for people, places, events, and records (Foote, 2018).

Here is an example of what a simple MongoDB address "card" looks like "in raw form."

```
{
  person: {
    first_name: "Peter",
    last_name: "Peter",
    addresses: [
      {street: "123 Peter St"},
      {street: "504 Not Peter St"}
    ],
  }
}
```

Source: Kvalheim, 2012.

There may be a "card" for the individual in the treatment court, related persons and organizations such as their employers, court orders, treatment providers, treatment programs, treatment program reports, test results, sanctions, incentives, financial tracking, modifications in treatment orders or programs, and final reporting/results, for example. There are links between all the cards as needed. This is the "magic" of this new database approach.

What specifically is that "magic" that MongoDB provides? In summary, it is the ability to:

- create and uniquely identify and index each card (meaning instant retrieval)
- edit cards for not only data but also new data fields as needed
- create and link, in any relationship, any card to one or many cards
- search by file and full text search the cards
- control and validate the data in the cards (like relational databases)
- provide audit tracking of card modification

For a more detailed technical explanation and a comparison with the MySQL relational database, see "Mongo DB vs. MySQL" at https://tinyurl.com/qzay635.

Implementation

Because a MongoDB can work "in the cloud," it can be easily deployed in each treatment court. A court system could design and build one and then copy it as needed. Alternatively, it would also be possible to create one system for all treatment courts in the state or jurisdiction and allow them to share treatment and statistical performance information.

One of the challenges in evaluating treatment courts is the need to use data from partners outside of the court, such as number of treatment sessions attended, assessment results, or results of drug tests. When the data elements necessary to collect this information are not present, the information is captured in rudimentary ad hoc systems or in text boxes making analysis difficult. NoSQL/MongoDB's flexible data structure enables it to incorporate any type of data—no matter what it looks like or where it comes from. Additionally, because it is "in the cloud," NoSQL/ MongoDB provides the opportunity for team members outside of the court to enter information into the database, reducing double data entry, facilitating communication between team members, and setting the foundation for measuring and evaluating the court's performance.

Most importantly, perhaps, is NoSQL/MongoDB's capacity for real-time analytics. Many treatment courts do not have the resources to have analysts, so program coordinators devote time and energy to compiling data when they need to report it. Real-time analytics drastically advance a court's ability to use data to operate, to make program and process improvements, and to identify emerging issues—all while conserving valuable court resources.

Data Sharing, Protection, and Security

When considering cloud-based solutions, there is often a concern with security, especially of sensitive information. NoSQL/MongoDBs are already being used for medical records with the capabilities contained in the commercial version of the product. This is because the database, the card, and the data fields' information can be encrypted. So those systems, such as what is envisioned in this article that contain HIPAA data, require the use of encrypted data to protect the participants' information. MongoDB has posted a website (https://tinyurl.com/yaqsraxz) with their recommendations on security compliance to meet HIPAA and similar privacy regulations.

Future

Treatment courts are more likely to be successful when there is information sharing between team members and efficient, low-cost ways to manage data. NoSQL/MongoDB provides that infrastructure and so much more. A cloud-based approach allows for shared development, shared cost, and the potential for mobile apps and other new technology, such as online scheduling and reminder systems, to be created. The flexibility, accessibility, and low cost of this approach makes it one that deserves serious consideration by treatment courts throughout the country. If your court is interested in learning more about NoSQL/MongoDB, please see https://tinyurl.com/qzay635.

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