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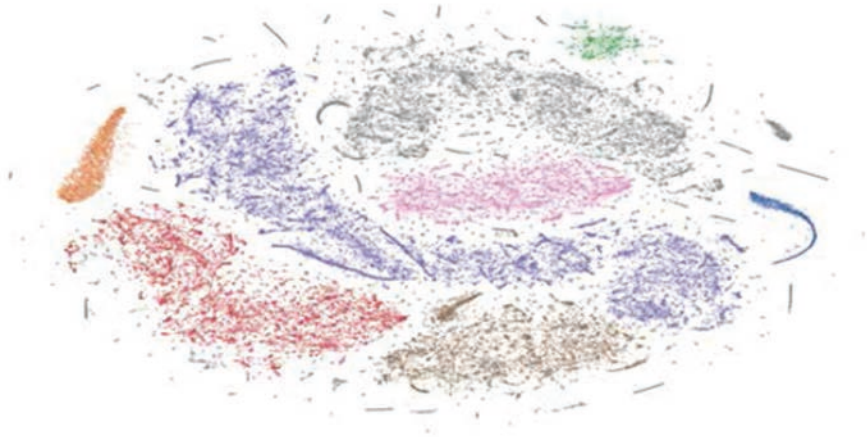
A new era of data analytics for investigations and litigation

You do not need to be a data scientist to gain competitive advantage from analytics – but you do need the gumption to appreciate what is achievable – and the scepticism to separate it from speculation. FTI Consulting's Nick Hourigan explains

A key differentiator for lawyers today is the ability to engage with advanced analytics methodologies (and supporting technology) that make the most of available data. Fortunately, there is a nearly endless supply of instruction and thought leadership that can be tapped with a modest time commitment. Couple that with a willingness to risk exposing naïveté in initiating a few awkward conversations among colleagues (*I just read a thing online about machine learning. Are you using that in any of your matters? Does the machine actually learn?*), and a lawyer is well on the way to becoming an effective consumer of advanced analytics. Some recommended topics and terminology for fluent advanced analytics conversations include: algorithm, clustering, machine learning, natural language processing, network analysis, scripting language, time-series analysis and topic analysis.



Many will have an existing grasp of technology assisted review (TAR) or predictive coding in processing documents and emails. While the specific advanced analytics technologies considered here may vary substantially from those used for TAR, the concepts are shared: we want the computer to do the things we aren't good at or can't do efficiently. Cases involving transactional or structured data sets (think: LIBOR) once thought too vast or complex to proceed with can now be managed in a commercially viable manner with new real insights readily available. Technology-driven insights can now be extracted from matters where the information sources were once too varied, the deception footprint too subtle, or the silver-bullet transactions too deeply buried.

There is clear evidence that courts and regulators are becoming more accepting of analytics as an expert function, and are open to using it to inform decisions. Indeed, the evolution of advanced analytics in court will follow that seen with e-discovery and TAR here and abroad. The challenge remains open: how to be an effective client advocate by bringing the right scepticism to moderate enthusiastic adoption of technology.

SOME REASONS TO CONSIDER ADVANCED ANALYTICS TECHNOLOGIES AND APPROACHES

When there's more data than your tools can handle

Perhaps the most obvious time to look at these newer technologies is when the scale of the data exceeds what existing tools can comfortably handle. This is less about the size of the data you need to store and more about the amount you need to actively analyse. Structured query language (SQL), dating to IBM in the 1970s, is dubbed 'intergalactic dataspeak' because it is the predominant language for operating on relational databases. These platforms handle billions of records with aplomb and are very easy to work with. For these reasons, many projects begin with SQL data stores and end in SQL results tables.

Clever analysis of all that information may best be done elsewhere, however. In one recent engagement, we needed to precisely trace the sources of funds for a dozen payments by iteratively looking back at each preceding payment in a population of millions of banking transactions.

Jack got the money from both Peter (who received some from each of his parents) and Sue (who had earned most but borrowed some from Tom). Peter's parents in turn had each…

This kind of analysis, where you need to recursively bifurcate and iterate hundreds or thousands of times, doesn't work well in SQL, is nearly impossible in Excel, and is even cumbersome to describe as an example in an article. But a thoughtfully written program in Python (a scripting language) can perform the analysis with ease over tens of elapsed years and millions of transactions. There is complete freedom as to how the steps are written down, as long as it's forensically sound and the interesting parts can be decoded for presentation. Without the aid of such a program, human experts are limited to piecemeal or sample analyses, and anecdotal evidence to the court. Lawyers who can see the opportunity to enable expertise with advanced analytics will be at a competitive advantage, and improve client outcomes.

When you want the data to speak to you

In other instances, it's less about a targeted end point, and open-ended questions such as, "What's going on here?" are appropriate. (Proceed with caution if money and time matter!) Good data science, enabled by subject matter expertise, can bring tremendous power to answering these questions. The data science insight can be completely complementary to the forensic analytics, and can actually help focus and prioritise traditional analytics.

We performed cluster analysis to investigate financial crime on a matter, and I recall walking by one of our scientists' screens and seeing seven groups of brightly coloured dots. When I asked what I was looking at, he said, "I have no idea…" (very pregnant pause) "…but I do know that these are seven distinct patterns of transactions that exist in the payments data." While the reality is that these clusters never perfectly identify the exact thing you were looking for, with an integrated capability there is tremendous power.

In the example above, the application of data science had the benefits of both short-cutting the analytics, which minimised consulting spend for the client, and identifying the signature pattern of a particular type of financial crime – something that would have been very difficult to spot by asking closed, directed questions.

Iteration plays a key role, and beyond having data science skills, a firm needs to effectively layer on subject matter expertise with traditional analytics. Harmonising the approach can be tricky, demanding active communication and integrated teams. In the example above, we incorporated time series analysis, which identified, and either muted or highlighted, periodic (seasonal) transactions. If searching for a needle, this can be a very effective way of removing the haystack.

When you need to treat all information as information

Often, it's unimportant whether information comes in the form of database transactions or as free text – what's important is to understand the whole picture. Advanced analytics makes that possible. Modern tools and techniques enable concurrent analysis of structured and unstructured data, even on the same platform. A layering of techniques is frequently required, necessitating a team with the experience not to waste endless hours oaring around with analytics.

In one analysis of complaints coming from a rich data set (think: wide, with lots of information-filled columns) containing both structured information and loose text, we deployed multiple techniques. First, natural language processing converted messy prose to pithy combinations of keyword tokens on which the computer performed topic analysis, a form of unsupervised machine learning. The half-dozen identified topics each became a numbered attribute (eg, 1-6 — rather than clumps of free text) associated with each complaint record. Finally, this numeric topic attribute could be combined with the other structured data and used in a statistical cluster analysis that more finely grouped the records, enabling investigators to drill down into important issues, such as particular problems associated with a certain product.

Such data is invariably going to require human interpretation. Here, the latest tools make life easier for human experts, not only by presenting them with comprehensive information, but by doing so in formats that are readily intelligible. Visualisation platforms are increasingly powerful and actually deliver on the promise of 'visual analytics' rather than just being nice pictures of something you have already figured out. They make it easy for lawyers and other experts to interrogate and interact with large databases directly and flexibly. This way, analytics consumers can explore the data freely, focusing on one aspect and filtering out another, to gain rapid insights.

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WHERE NEXT?

This account of modern analytic techniques is emphatically not a call for ditching traditional approaches. The new approaches complement existing methods and are in part a response to the ever-increasing volume and complexity of data, which would be impossible to handle otherwise. Looking at the full range of techniques available, including the latest, widens legal teams' options, and means cases that in the past might not have gone to court can now be brought to a successful resolution, while other cases can get there more effectively.

For most law firms, it is unrealistic to expect to have a full range of up-to-date data science skills in-house, especially given the rate of technology evolution. If partnering with an external organisation, it's advisable to look to firms that field an integrated team of data scientists, traditional analysts and deep subject experts; such multidisciplinary teams can work with lawyers seamlessly to apply all that knowledge to investigations. Otherwise, too much can get lost in translation – analytics and science should be enabling expertise, not befuddling it with clever output.

What you as a lawyer need today is a broad familiarity with the options available, a solid enough understanding to interact effectively with internal or external analytics providers, and, above all, the enthusiasm to explore the best technologies to help you meet demands and stay competitive. Don't worry too much about definitions. Everything today seems to be machine learning or AI, in the same way that three years ago everything was big data. Do risk the awkward conversations so that you and your colleagues can develop a comfortable fluency around the kind of analytics that affect your practice.

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