How Data Analytics Can Weed Out College Admissions Fraud

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Top-tier colleges and standardized test providers — whether implicated in the "Operation Varsity Blues" college admissions scandal or realizing their own similar vulnerabilities — are scrambling to assess years of admissions records for signs of misconduct. Forensic analytics, the analysis of data to detect unique patterns or anomalies, can help find the needles in the massive haystacks of college admission files.

The recently reported indictment of 50 individuals likely represents the tip of the iceberg. How can a university defend itself if investigations continue to expose new culprits, if schools could have likely easily detected misconduct with basic forensic analytics?

Forensic analytics can be deployed to quickly and effectively determine sets of risk indicators, apply those indicators to available data sets, and queue investigation resources. These steps are applicable in the proactive creation of analytical controls as well, and variations in how forensic analytics might be applied for preventative controls will be addressed. The diagram to the right provides a view of how forensic analytics fits into the controls life cycle.

	REACTIVE ◀ ▶ PROACTIVE	
QUANTITATIVE ▲	Forensic Analytics (Detect potential misconduct)	Preventative Analytics and Controls
▼ **QUALITATIVE**	Investigation	Proactive Due Diligence
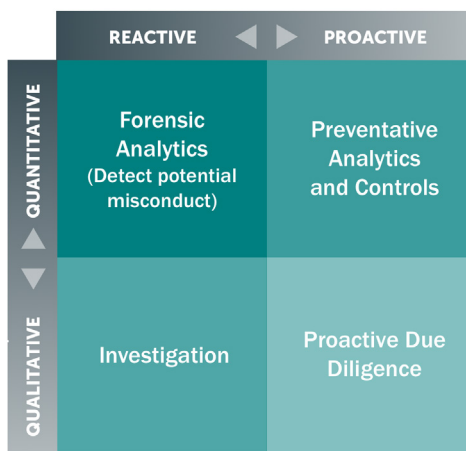
Most projects require multidisciplinary experts in forensic risks and controls, data analytics and investigations. For the purposes of this article, we will continue to refer to the discipline as "forensic analytics" with an understanding that each discipline will be drawn upon. The following is a high-level summary of the forensic analysis process.

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1	2	3	4
Identify Potential Scenarios	**Develop Risk Indicators & Data Tests**	**Collect, Assimilate & Analyze Data**	**Identify Patterns & Prioritize Results**

Identify Potential Scenarios

Next, brainstorm to identify red flags of misconduct and consider how quantitative and qualitative data might expose them. Using Varsity Blues schemes as an example, consider:

- Financial aid and family income as indicators of ability to pay bribes;

- Multiple test-taking, since cheating is more likely to occur after the student did not achieve a sufficiently high score on his/her first test;

- Score improvements significantly beyond the average expected increase when taking multiple tests, as a subset of the above indicator;

- Accommodations for extended time to complete exams that are granted inappropriately or that allow substitute test takers and corrupt proctors a setting under the radar;

- Change in venue for substitute test takers and corrupt test administrators to avoid student's high school where proctors can identify students;

- GPA vs. test score to identify anomalies between students' ultimate test score and the average expectation based on GPA;

- ACT vs. SAT to find vastly different percentiles for students who take both the ACT and SAT;

- Not joining the team as a means to uncover abuse of the student athlete admissions;

- School ranking, because fraud is more likely to occur at high schools and colleges with the most selective enrollment, although no institution is likely immune.

Do not allow the siloed nature of available data limit the creation of red flags. Forensic data engineers and analysts are adept at combining data sources and developing risk indicators from existing data structures.

Collect, Assimilate and Analyze Data

Much of the relevant data for university admissions comes from a student information system for existing students or from the application process and public sources for prospective students. The analyst must identify sources of information, collect the necessary data, and clean, format, and structure the data to ensure consistent identifiers across data sources (e.g., matching a student's unique Social Security number to another data set based only on name and address fields). The analyst loads the cleaned and enhanced data into a common database to apply risk indicators and subsequent analysis.

Identify Patterns and Prioritize Results

Individual red flags are little more than data points; even multiple red flags rarely prove fraud or impropriety. Red flags can, however, suggest increased likelihood of potential misconduct and help to prioritize the investigation into and remediation of misconduct.

For Operation Varsity Blues-related reviews, forensic analysts take advantage of known perpetrated schemes and evaluate the relative effectiveness of each risk indicator. Predicative analytics, specifically, can be used to determine how much each red flag or each combination of red flags should move a student up or down the prioritization list for subsequent investigation. After indicating in the structured data sets which students have been involved in fraudulent applications, a simple correlation calculation will assign a relative weight to each variable, or risk indicator in this case. A forensic analyst might also elect to weight the interaction between variables to determine if two particular risk indicators work in tandem to most effectively predict fraud or if two variables are highly correlated (likely to occur together).

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Once the relative effectiveness of each indicator is determined, it is possible that patterns or trends will emerge based on certain student or test attributes. A forensic analyst should explore each identified pattern to determine whether or not there is or could be an innocent explanation. For example, scores from the same SAT test center with above expectation test score improvements might be cause for concern. But the pattern might also just indicate a high-quality test prep center or local tutor. Universities must be careful about "false positives" and not jump to conclusions.

For proactive controls, forensic analytics will not have the benefit of weighing risk indicator effectiveness against known allegations. However, the same review of patterns can be used to calibrate the models or controls and avoid false positives. Using a similar example as above, if a pattern emerges that science, technology, engineering and mathematics majors tend to, on average, improve their second test scores relative to non-STEM majors, a forensic analyst may want to change the risk indicator threshold based on an applicant's designated major.

Next Steps

With the prioritized list of students and an understanding of potentially fraudulent patterns, universities can intelligently approach the steps that follow. A university can engage counsel and investigators to perform interviews, evaluate controls and consider the risks of an issue. Existing faculty might be consulted relative to the highest-priority students (or apply a stratified random sample approach from that same student list) to consider academic status. In addition to "look backs" of admitted

student populations, universities can integrate forensic analytics as detective controls as they enhance admissions compliance programs and controls prospectively.

Recent headlines highlight the need for universities to focus efforts on rooting out misconduct in the admissions process. They must also be able to assure the university community, donors, alumni, prospective applicants and their families that the admissions process is a fair one based on individual merit. Forensic analytics can be a key tool in meeting these objectives.

About the Authors

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