



CLEAR LEARNING

CLEAR Call Webinar Series

How regulatory agencies are using big data to predict non-compliance

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www.clearhq.org

Council on Licensure, Enforcement and Regulation

Background



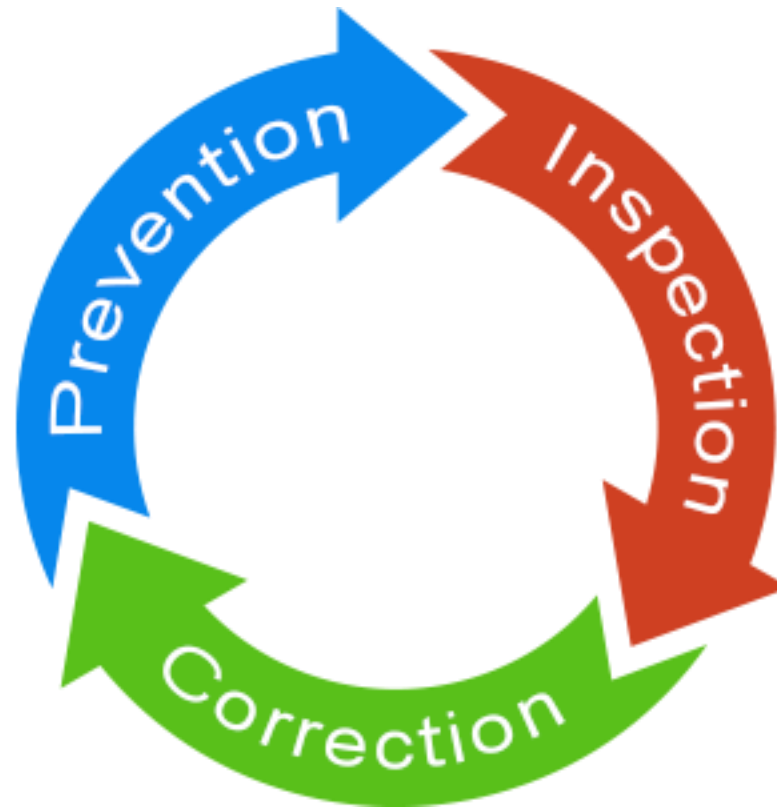
Mark Parker

- President at Outlier Technologies and original author of SansWrite
- 25+ years of experience automating the full Compliance Monitoring Cycle
- Trusted Advisor to Regulatory Agencies and Regulated Businesses throughout the US and Canada
- Former NARA Board Member, Treasurer and Chair of the Finance Committee

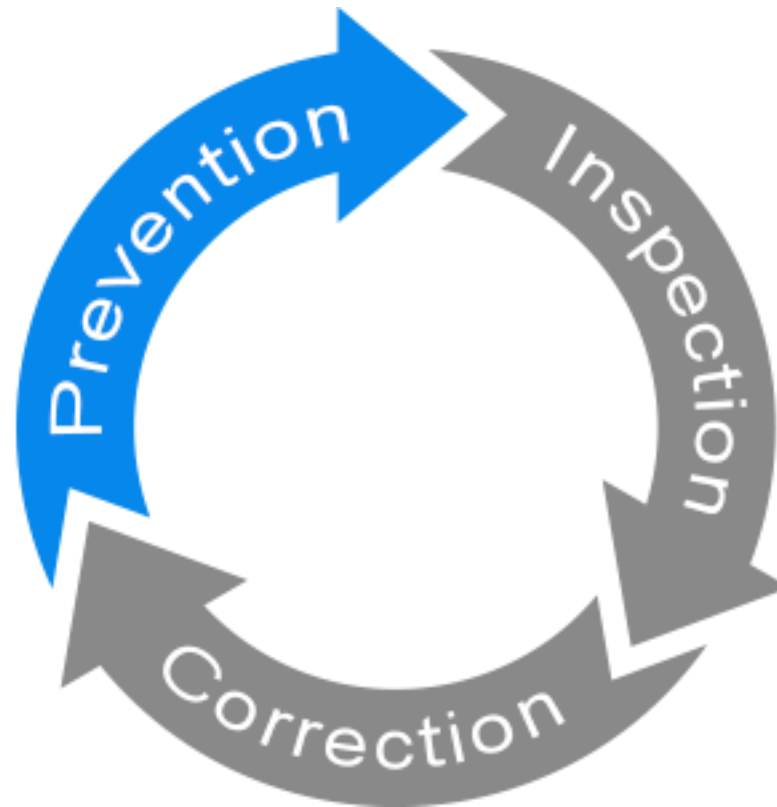
Rick Fiene

- ▶ Research Psychologist and Regulatory Scientist
- ▶ Has spent professional career in improving the quality of childcare nationally and internationally
- ▶ Extensive research and publishing on the key components in improving childcare quality through an early childhood program quality indicator model
- ▶ Research has also made significant contributions in regulatory science related to measurement and monitoring systems

Compliance Monitoring Cycle



Compliance Monitoring Cycle



What is Data Analytics



Data analytics is the practice of examining data to answer questions, identify trends and extract insights.



Data Visualization



Polling Question #1







The Leading Indicator of Non-compliance

What is Big Data?



The six Vs of big data

Big data is a collection of data from various sources, often characterized by what's become known as the 3Vs: *volume*, *variety* and *velocity*. Over time, other Vs have been added to descriptions of big data:

VOLUME	VARIETY	VELOCITY	VERACITY	VALUE	VARIABILITY
The amount of data from myriad sources.	The types of data: structured, semi-structured, unstructured.	The speed at which big data is generated.	The degree to which big data can be trusted.	The business value of the data collected.	The ways in which the big data can be used and formatted.
					

Big Data Uses



- Social Media
 - Targeted Advertising
- Manufacturing
 - Minimizing Downtime
- National Security / Public Safety
 - Predicting Potential Threats and Crimes

Regulatory Agency Focus



- Volume
 - Amount of Data
- Variety
 - Types of Data
- Veracity
 - Trustworthiness of Data



- Storage (and Disaster Recovery)
 - On-prem, Cloud-based and Hybrid
- Many Sources and Repositories
 - Databases, Email Servers, Shared Drives, etc.
- Accessibility
 - Data Visualization

Variety



- Unstructured
 - Email, Word Documents, Fillable PDFs, etc.
- Semi-structured
 - Excel Spreadsheets
- Structured
 - Relational Databases



Polling Question #2

Technologies used to Capture Inspection Results

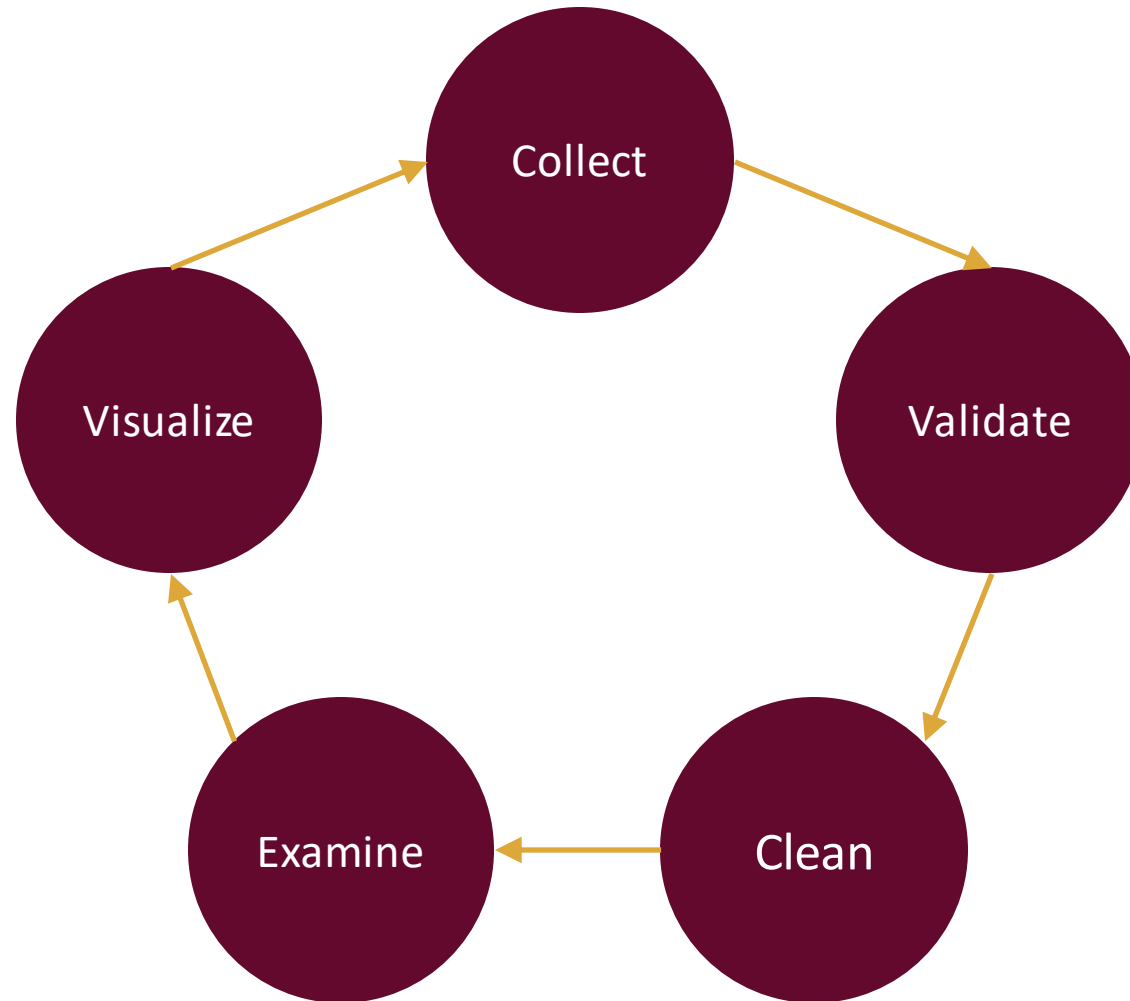


- **High** (Accurate, Consistent, Relevant and Unbiased)
 - Internet of Things (IoT) Input
 - Sensors, Cameras, Microphones, etc.
 - Picklist Input
 - Dropdown Lists, Radio Buttons, etc.
 - Freeform Input
 - Typing, Voice-to-Text, etc.
- **LOW** (Inaccurate, Inconsistent, Irrelevant and/or Biased)



Data Entry Example

Data Analysis Process



Data Analytics in Compliance



- **Descriptive**
 - What happened?
- **Diagnostic**
 - Why did it happen?
- **Predictive**
 - What might happen in the future?
- **Prescriptive**
 - What should we do next?

Methods and Techniques



- Time Series Analysis
 - Month-to-Month, Quarter-to-Quarter, Year-to-Year
- Cohort Analysis
 - Region, Supervisor, Inspector
- Regression Analysis
 - Duration of License, Years of Experience, Staff Turnover



Data Visualization Example



Polling Question #3

Management Training for Licensees

Key Takeaways

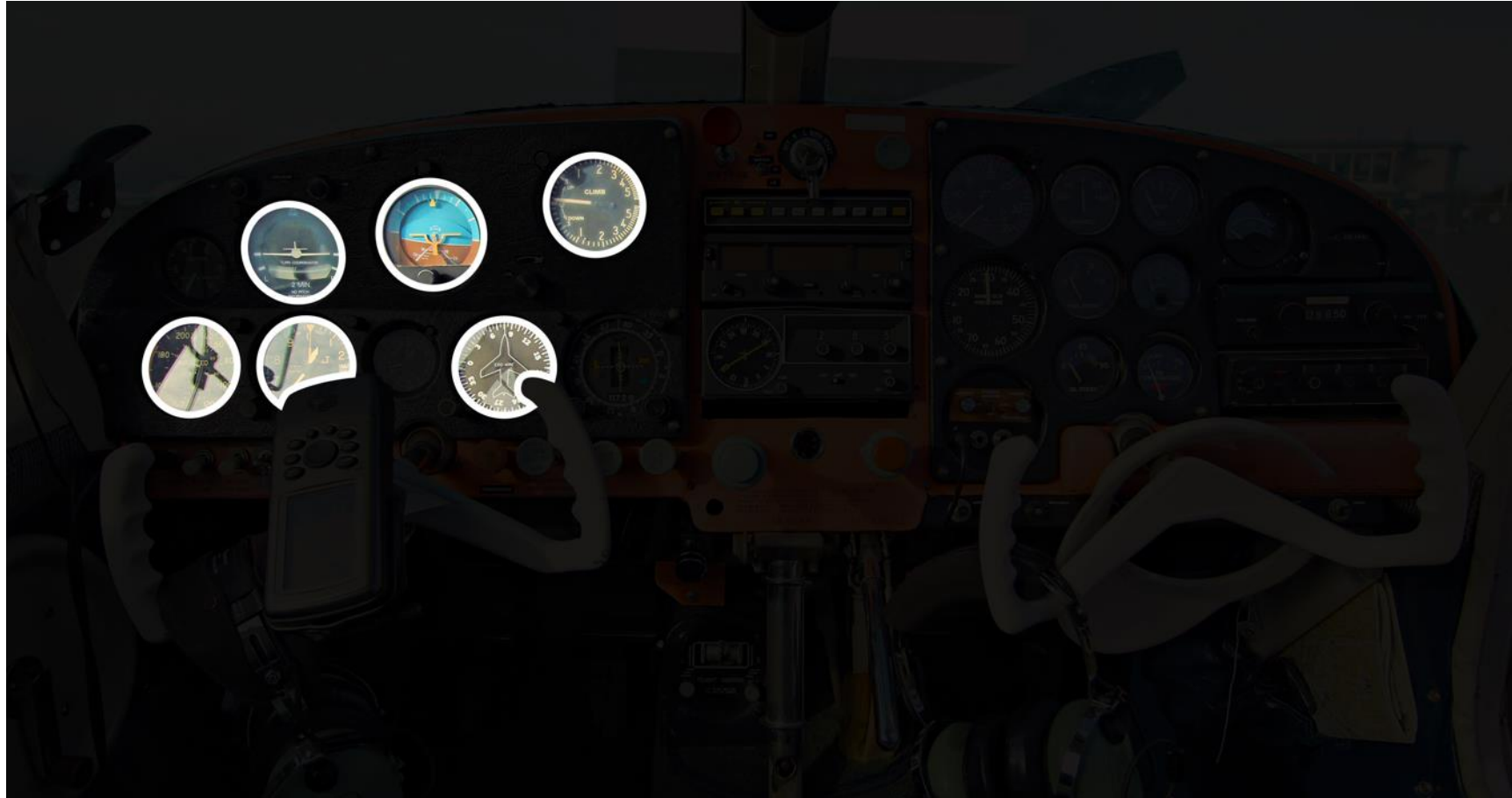


- Takes time but doesn't have to be expensive
- Data visualization is necessary for exploring large datasets
- Accurate and consistent data collection is what makes predicting non-compliance possible

Airplane Cockpit



Key Performance Indicators (KPIs)



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