



# Analytics In Government

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*Thursday, October 3, 2019*  
*DIR Technology Forum*

# What is Analytics?

- Analytics is an encompassing and multidimensional field that uses mathematics, statistics, predictive modeling and machine-learning techniques to find meaningful patterns and knowledge in recorded data.

## Why is Analytics Important?

- What happened?
- How or why did it happen?
- What's happening now?
- What is likely to happen next?

## What we do with Analytics is the Impact

# Data and Analytics Driving our World

## Impact in Our World Today

*Finance and Credit  
Monitoring*



*Retail and Marketing*

*Manufacturing  
And Energy*



*Fraud and Security*

# What makes data Meaningful?



## IN THE RIGHT PLACE

Moves efficiently  
between  
multiple systems



## AT THE RIGHT TIME

Immediate reactions,  
streaming sensor data,  
overnight batch processes



## IN THE RIGHT FORMAT

Validated, standardized  
or enriched; data is  
made usable



## FOR ALL USERS

Usage governed; busi-  
ness semantics applied

# ENTERPRISE ANALYSIS

Visualization & Analytics



Prepare Data



Model



Optimization



Decision Flow



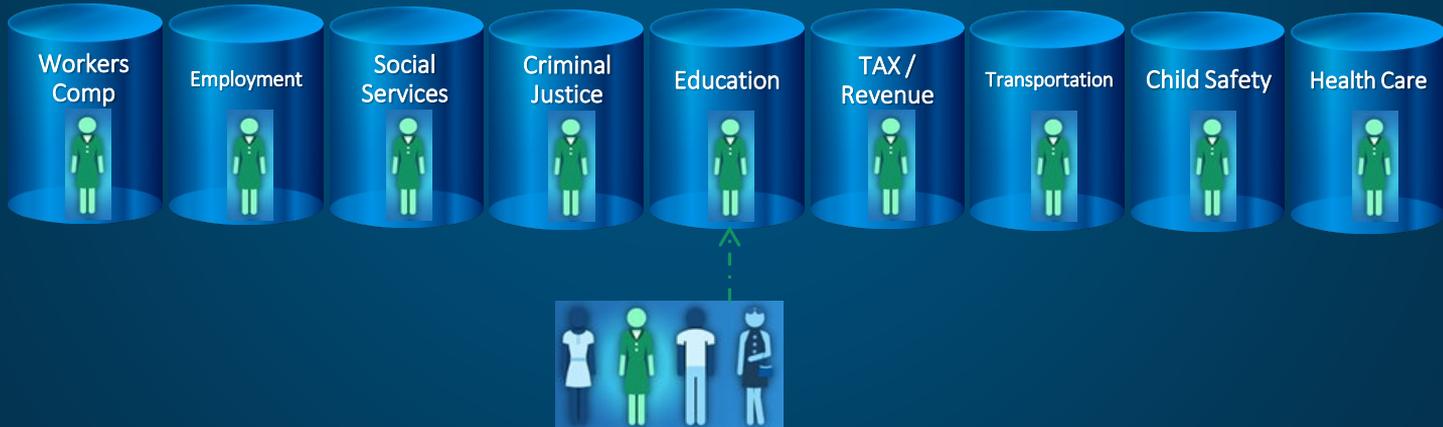
Monitor & Report



Alert Generation

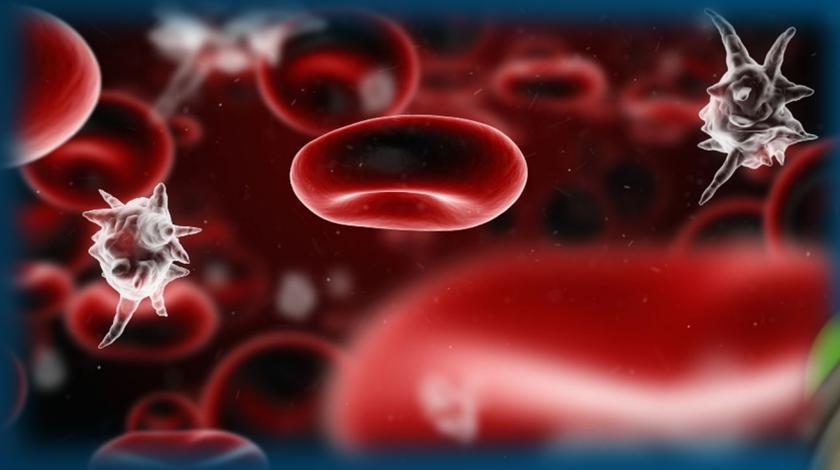
## Common Technology Framework

### Consolidated View of Data for Cross-Program Analysis





# Health and Well-being

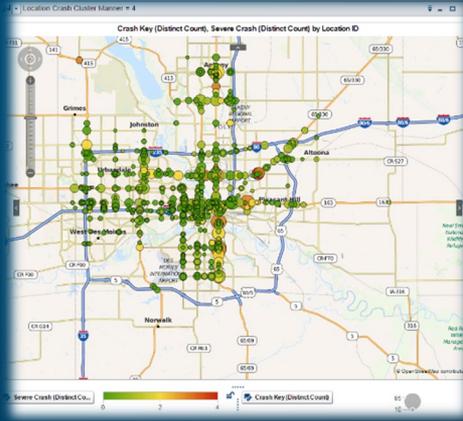


1500  
**HEALTH INSURANCE CLAIM FORM**

PICA

1. MEDICARE <input type="checkbox"/> (Medicare #)	MEDICAID <input type="checkbox"/> (Medicaid #)	TRICARE CHAMPUS (Sponsor's SSN)	CHAMPVA (Member ID#)	DUP LTH PLAN Y or ID)	FED BL (SSN)	OTHER (ID)	1a. INSURED'S I.D. NO.
2. PATIENT'S NAME (Last Name, First Name, Middle Initial)		3. INSURED'S BIRTH DATE DD MM YY		M	F	4. INSURED'S NAME	5. INSURED'S ADDRESS
5. PATIENT'S ADDRESS (No., Street)		6. PATIENT RELATIONSHIP TO INSURED		Child	Other	7. INSURED'S ADDRESS	8. INSURED'S CITY
CITY		9. OTHER INSURED'S NAME (Last Name, First Name, Middle Initial)		Part-Time	Student	11. INSURED'S POLICY OR GROUP NUMBER	12. INSURED'S DATE OF BIRTH MM DD
ZIP CODE		TELEPHONE (Include Area Code)		10. IS THIS CLAIM FOR A PREVIOUS POLICY?		a. INSURED'S DATE OF DEATH MM DD	

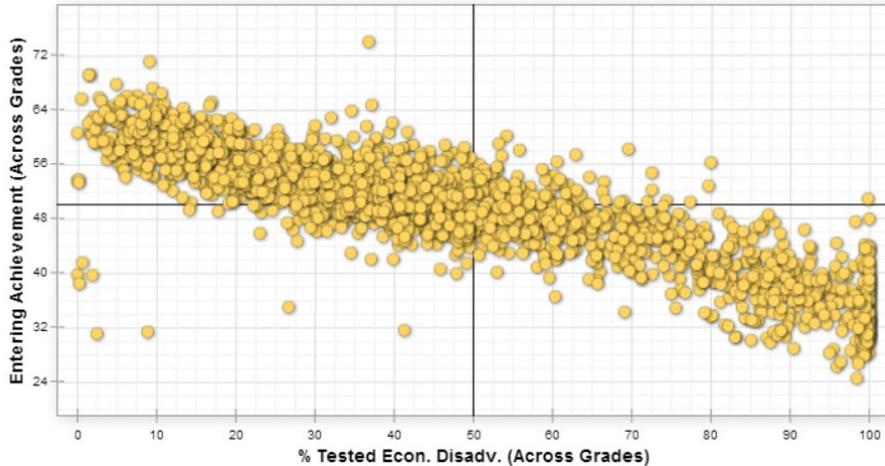
# Transportation Optimization



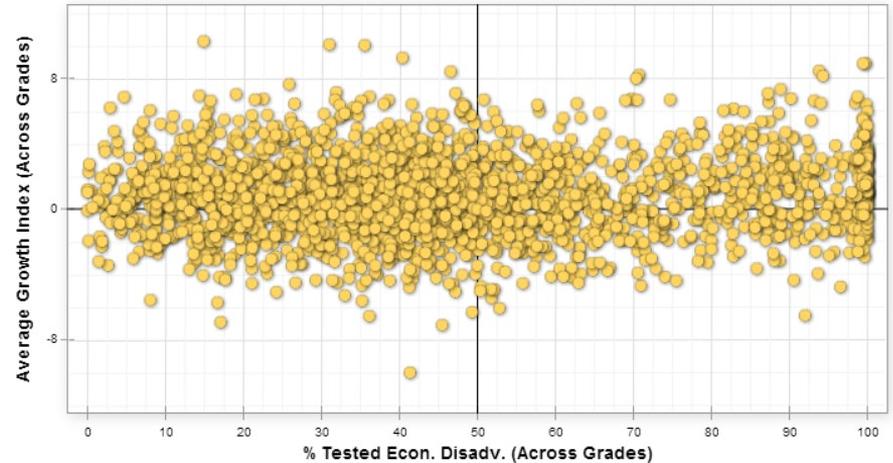
# The power of two

## A more complete picture of student learning

### Achievement



### Growth

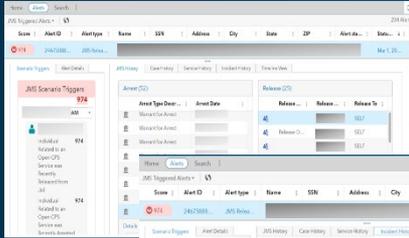


Source: PA 2012 - 2013 data by school for PSSA Reading across grades. Each dot is a school in PA.

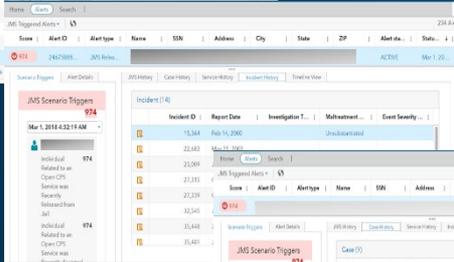
# Justice and Public Safety

## Child Safety

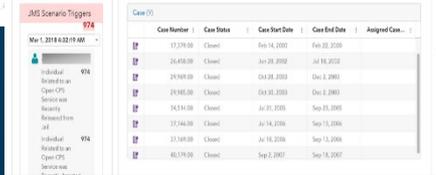
## Criminal History



## Incident History

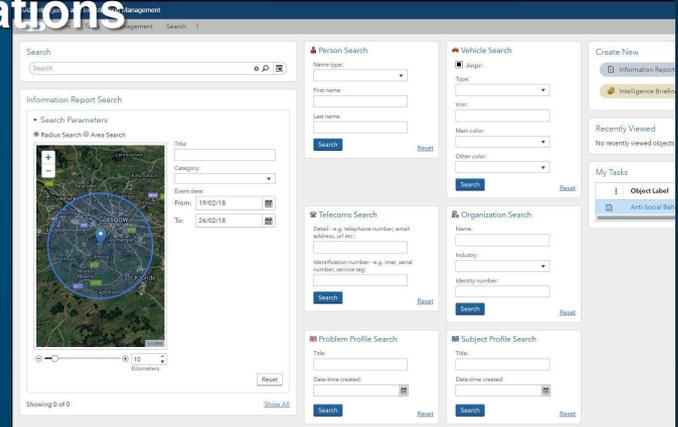


## Case History



## Offender Management

## Intelligence and Investigations



# New Jersey – Integrated Drug Awareness Dashboard



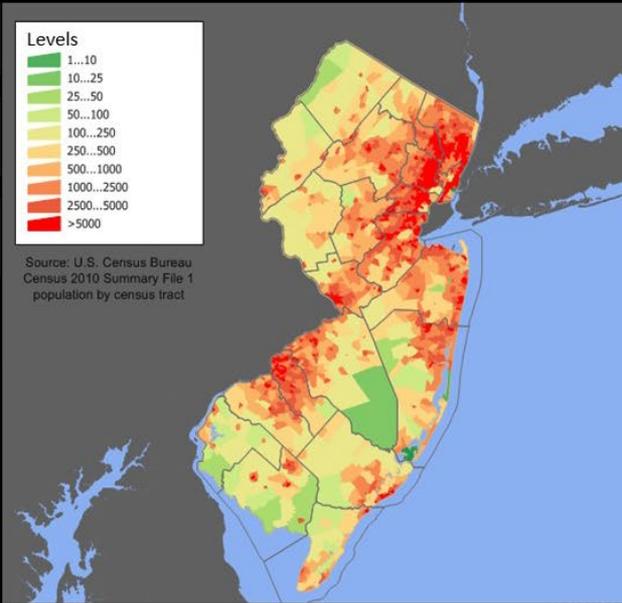
## Integrated Drug Awareness Dashboard



### Key Metrics

Metric	1 Mnth	6 Mnths	12 Mnths
Fatal OD	<span style="color: orange;">■</span>	<span style="color: orange;">■</span>	<span style="color: red;">■</span>
Non-Fatal OD	<span style="color: blue;">■</span>	<span style="color: orange;">■</span>	<span style="color: red;">■</span>
Naloxone Admin	<span style="color: blue;">■</span>	<span style="color: yellow;">■</span>	<span style="color: yellow;">■</span>
Arrest: Shootings	<span style="color: blue;">■</span>	<span style="color: lightblue;">■</span>	<span style="color: lightblue;">■</span>
Arrest: Drug Related	<span style="color: yellow;">■</span>	<span style="color: orange;">■</span>	<span style="color: red;">■</span>
Arrest: Thefts	<span style="color: lightblue;">■</span>	<span style="color: orange;">■</span>	<span style="color: red;">■</span>
Opioid Total	<span style="color: orange;">■</span>	<span style="color: orange;">■</span>	<span style="color: red;">■</span>
Synthetic/Fentanyl	<span style="color: blue;">■</span>	<span style="color: yellow;">■</span>	<span style="color: orange;">■</span>
Heroin	<span style="color: blue;">■</span>	<span style="color: yellow;">■</span>	<span style="color: orange;">■</span>

### Statewide Hotspots



Drug Arrests    Naloxone    Deaths OD

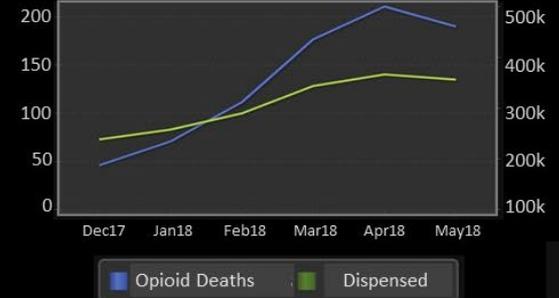
### Distinct Locations

### Risk Level

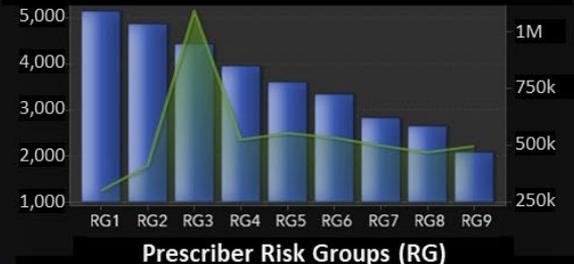


Distinct Locations    Risk Level

### Opioid-Related Deaths vs. Dispensed



Opioid Deaths    Dispensed



### Prescriber Risk Groups (RG)

Prescribers    Total MMEs



# Artificial Intelligence

is the science of training systems to emulate human tasks through Learning and Automation



Understand  
Context



Learn  
Patterns



Recognize  
Objects

## Learning

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Images

Transactions

Users

Medical Images

Languages

Emails

## Automation

Is this you?

Is it fraud?

Will they buy?

Is this healthy?

Translate?

Is it spam?

## Benefit

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More Secure

Lower Risk

Higher Return

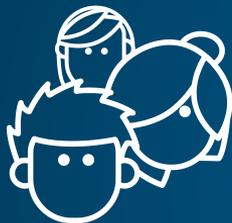
Better Outcome

Reduced Cost

Better Experience

# What are we and machines good at?

## US



### GOOD AT

COMMON SENSE

INTUITION | CREATIVITY

EMPATHY | VERSATILITY

## MACHINES



### GOOD AT

LARGE DATA SETS

COMPLEX CALCULATIONS

LEARNING | AUTOMATION

# What are we and machines good at?

US



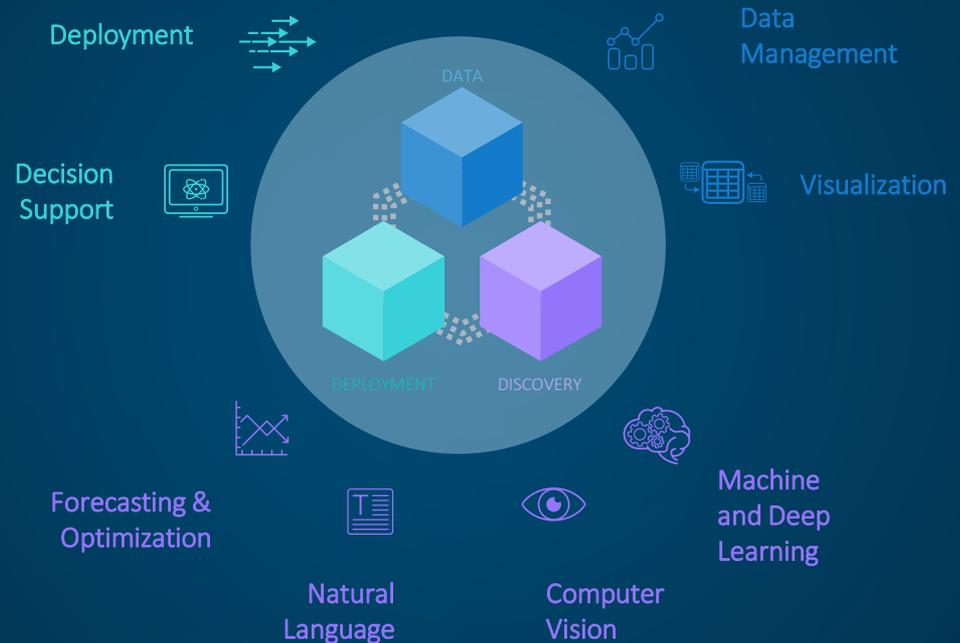
+

MACHINES



AI enhances our capability  
and gives organizations  
competitive advantage

# AI capabilities in the Analytics Lifecycle



# The Impact of AI



Data for  
Good

90%

accuracy for ID of  
wildlife using tracks<sup>5</sup>



Telecom

53%

fewer customer  
complaints<sup>1</sup>



Healthcare

Improved  
liver & brain  
tumor diagnosis  
with AI & analytics



Financial

2.7x

increase in client  
purchase rates<sup>4</sup>



Manufacturing

Continuous learning  
and Insight from  
clients to improve  
design & quality<sup>2</sup>

# FINAL THOUGHTS

- While data is a great and analytics can help us solve some of our greatest social problems, we must always respect the privacy of other people's personal information.
- With the wealth of data we need to ensure that we are always using the information for the good of others.
- Analytics can only benefit the common good if we choose to take action.



# Discussion?

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